California Public Utilities Commission

Energy Efficiency
2006-2007 Verification Report
REVIEW DRAFT

Prepared by Energy Division

November 18, 2008

Acknowledgments

We wish to acknowledge the effort put into completing this report by the CPUC Energy Division staff and all of the consultants and contractors who performed the detailed work and provided valuable insights.

Table of Contents

1. Executive Summary

1.1. Background

In Decisions 07-09-043 and 08-01-042,[1] the California Public Utilities Commission (CPUC or Commission) adopted a Risk/Reward Incentive Mechanism (RRIM) to encourage the utilities to invest in energy efficiency. The mechanism enables the investor owned utilities[2] to earn rewards on energy efficiency programs in amounts comparable to what the companies would otherwise earn through supply side investments. The Decisions establish a performance standard for the utilities, under which the utilities earn incentives if their energy efficiency program portfolios achieve certain quantitative energy efficiency savings goals.

Under the process adopted in Decisions 07-09-043 and 08-01-042, Energy Division is required to verify the costs and installations of the energy efficiency program activities, update the ex-ante parameters used to estimate program savings and benefits, and publish reports that calculate the earnings the utilities are eligible to claim. There are two interim earnings claims during the 2006-2008 three-year program cycle that are "progress payments" towards total expected earnings, and one final "true-up" payment after the program cycle is completed. This Verification Report applies to the first interim incentives claim for the 2006-2008 program period, and covers program years 2006-2007.

The RRIM earnings accrue if the utility meets or exceeds the Minimum Performance Standard (MPS), a threshold of 85% of the Commission's savings goals (80% for SoCalGas). If the utility achieves 100% of the goals, the earnings rate increases as a reward for superior performance. The 85% and 100% threshold earnings rates, set at 9% and 12% respectively, are used to calculate a share of the Performance Earnings Basis (PEB),which determines the amount of shareholder incentives that the utility will be eligible to collect from electric distribution or gas transportation rates. The PEB is an estimate of the benefits created by the utility portfolio minus the costs of the utility portfolio, measured in monetary terms.

The key threshold requirements for the 2006-2007 interim earnings claim from Decisions 07-09-043 and 08-01-042 are:

- If the metric average is equal to or greater than 65% and below 85% of goal (80% for SoCalGas), and each individual metric is equal to or greater than 65% of goal, then there are no earnings and no penalties.

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[1] Available at http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/73172.PDF and http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/78370.pdf

[2] "Utilities" or "IOUs" refer to Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas and Electric Company (SDG&E), and Southern California Gas Company (SoCalGas).

- If the metric average is equal to or greater than 85% (80% for SoCalGas) and below 100% of goal, and each individual metric is equal to or greater than 80% of goal, then the IOU can claim 9% of PEB in earnings.
- If the metric average is equal to or greater than 100% of goal and each individual metric is equal to or greater than 95% of goal, then the IOU can claim 12% of PEB in earnings.
- If any individual metric falls to or below 65% of goal, then penalties will be applied.

Table ES1 above sets forth the incentive amounts for which each utility is eligible in this first interim period. Table ES2 provides the kWh, kW and Therm savings calculated for each utility.

The total accomplished kWh, kW, and Therm savings included in the MPS calculation are the sum of the following quantities:

- The 2006 and 2007 EE portfolio *verified* kWh, kW, and Therm savings accomplishments.
- 50% of the 2006 and 2007 *verified* savings attributed to pre-2006 Codes and Standards advocacy work.
- The 2004 and 2005 EE portfolio *evaluation adjusted* kWh, kW, and Therm savings accomplishments.
- The 2004 through 2007 LIEE program *evaluation adjusted* GWh, MW and MTherms savings accomplishments.

The PEB is a representation of net program benefits, which is calculated by combining two-thirds of the Total Resource Cost (TRC) net benefits and one-third of the Program Administrator Cost (PAC) net benefits. The TRC and PAC are cost-benefit analysis methodologies commonly used for evaluating utility sector Demand-Side Management programs. The TRC and PAC costs include program administrative costs. The TRC additionally includes the costs incurred by program participants. The TRC and PAC benefits include estimates of supply-side costs avoided by the implementation of energy efficiency programs.

The TRC and PAC net benefits are calculated as described in the Standard Practice Manual,[3] and as clarified in D.06-06-063[4] issued in Rulemaking 04-04-025, the 12/21/2006 AL>Ruling[5] issued in R.06-04-010, and modified for a "free-rider-adjustment" in D.07-09-043 issued in R.06-04-010. The TRC and PAC tests, and their application to the PEB calculation, are described in the Energy Efficiency Policy Manual, Version 4.0.[6] In summary, the TRC and PAC tests convert electric and gas energy and electric demand savings to monetized avoided cost benefits, and produce (using

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[3] Available at http://www.cpuc.ca.gov/PUC/energy/electric/Energy>Effic iency/EM>and>V/

[4] http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/57756.htm

[5] http://docs.cpuc.ca.gov/EFILE/RULINGS/63120.htm

[6] http://docs.cpuc.ca.gov/EFILE/RULINGS/80684.htm

program administrative costs and program participant costs) benefit/cost ratios and monetized net benefit values. The TRC and PAC tests are calculated in a customized Excel spreadsheet known as the "E3 Calculator."

The components included in the PEB and MPS calculations are described in section 4 of the Report. The data used to calculate the MPS and PEB for the 2006-2007 Interim Verification Report are discussed in Section 5.

The methodology for calculating 2006-2007 savings and benefits is set out in Section 6 of the Report. The CPUC Energy Division (ED) developed the "Verification Report Template," which is a Microsoft (MS) Access application used to compile IOU savings and cost claims and program tracking data. The VRT supports automated E3 Calculator runs and can summarize savings and net benefits across all runs, by IOU, and place these results in the RRIM calculator developed by ED, included as part of Appendix G. Generation of adjusted energy savings and PEB values using the VRT is discussed in Section 6 of the Report. The VRT User's Manual is provided in Appendix F and the full VRT and associated files are provided in Appendix G. The VRT was developed to allow Energy Division to calculate the MPS and PEB in an efficient, transparent, and repeatable manner.

Energy Division developed a spreadsheet tool, the RRIM Calculator, to calculate the earnings or penalties for each utility, once the GWh, MW, and MMTh accomplishments have been assembled and TRC & PAC net benefits have been calculated with the E3 Calculator engine. The RRIM Calculator is designed to calculate and track the 2006-2007 and 2008 interim incentives as well as the final three year cycle true-up. Section 7 of the Report provides a walk-through for the RRIM Calculator.

1.2. Net Benefits and Allowable Earnings by IOU

Table ES1: Net Benefits and Allowable Earnings

	PG&E	SCE	SDG&E	SoCalGas
TRC Net Benefits	$ 372,030,358	$ 343,522,928	$ 90,555,185	$ 42,630,751
PAC Net Benefits	$ 484,263,057	$ 525,870,539	$ 136,915,146	$ 102,631,114
PEB	$ 409,441,257	$ 404,305,465	$ 106,008,505	$ 62,630,872
Earnings Rate				9%
Total Earnings				$ 3,663,906
Total Penalties		$ 17,844,483		

1.3. GWh, MW, MMTherm Impacts by IOU

Table ES2: GWh, MW, MMTherm Impacts

	First Earnings Claim (PY2006-2007)				
	PG&E	**SCE**	**SDGE**	**SoCalGas**	**Total**
Savings Goals			PY 2004-2007		
Total Cumulative Savings (GWH)	3,260.0	3,621.0	1,102.4		**7,983.40**
Total Peak Savings (MW)	708.0	760.0	209.5		**1,677.50**
Total Cumulative Natural Gas Savings (MMTh)	47.0		9.5	53.3	**109.80**
Achieved Savings Towards MPS					
EE Portfolio Savings (adjusted ex-ante)			PY 2006-2007		
Total Cumulative Savings (GWH)	1,302.9	1,475.8	332.1		**3,110.79**
Total Peak Savings (MW)	226.9	244.3	70.1		**541.29**
Total Cumulative Natural Gas Savings (MMTh)	21.0		3.3	26.2	**50.46**
50% C&S Savings (adjusted ex-ante)			PY 2006-2007		
Total Cumulative Savings (GWH)	69.2	69.3	16.2		**154.70**
Total Peak Savings (MW)	19.8	18.7	4.7		**43.20**
Total Cumulative Natural Gas Savings (MMTh)	1.9		0.2	3.1	**5.20**
04-05 EM&V Adjusted EE Portfolio Savings					
Total Cumulative Savings (GWH)	907.0	1,079.5	365.8		**2,352.39**
Total Peak Savings (MW)	193.6	204.9	64.0		**462.43**
Total Cumulative Natural Gas Savings (MMTh)	18.4		4.4	11.1	**33.86**
EM&V Adjusted LIEE Savings			PY 2004-2007		
Total Cumulative Savings (GWH)	100.3	81.2	21.3		**202.74**
Total Peak Savings (MW)	20.1	16.6	5.2		**42.01**
Total Cumulative Natural Gas Savings (MMTh)	4.6		0.9	3.5	**8.95**
Total Savings			PY 2004-2007		
Total Cumulative Savings (GWH)	2,379.4	2,705.8	735.4		**5,820.61**
Total Peak Savings (MW)	460.4	484.5	144.0		**1,088.93**
Total Cumulative Natural Gas Savings (MMTh)	45.8		8.8	43.8	**98.47**

1.4. Process for Finalizing this Report

The 10/20/2008 AL>Ruling[7] issued in R. 06-04-010 sets the schedule for this draft report, stakeholder comments, and the distribution of the final version of this report. Written comments are due to Energy Division on or before 5:00 PM December 15, 2008. Written comments should be uploaded to www.energydataweb.com/cpuc under the

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[7] Available at http://docs.cpuc.ca.gov/EFILE/RULINGS/92484.htm

topic area entitled “Verification Report for 2006-2007.” Energy Division will publish and distribute a final version of this report on January 15, 2009.

Attachment 7 of Decision 07-09-043 requires Energy Division to hold a conference where stakeholders may raise questions about this report, receive responses, and point out any errors they believe are contained in the report. This conference will take place on December 5 from 10:00 AM to 5:00 PM in Hearing Room E in the CPUC building at 505 Van Ness Avenue, San Francisco. Those not able to travel to the CPUC building may call the conference line at 1-877-954-0966 (Passcode 805443) and log on to https://www2.gotomeeting.com/register/885542619 to participate.

A second conference will be held after Energy Division has received and reviewed the written comments. The purpose of this second conference is for Energy Division to discuss the written comments with the comment authors. The second conference will be held only by conference call, using the number provided above, and a web meeting at https://www2.gotomeeting.com/register/718594520.

2. Introduction

In Decisions 07-09-043 and 08-01-042,[8] the California Public Utilities Commission (CPUC or Commission) adopted a Risk/Reward Incentive Mechanism (RRIM) to encourage the utilities to invest in energy efficiency. The mechanism enables the investor owned utilities[9] to earn rewards on energy efficiency programs in amounts comparable to what the companies would otherwise earn through supply side investments. The Decisions establish a performance standard for the utilities, under which the utilities earn incentives if their energy efficiency program portfolios achieve certain quantitative energy efficiency savings goals.

Decision 07-09-043 establishes the earnings claim and recovery process. There are two interim earnings claims during the 2006-2008 three-year program cycle that are "progress payments" towards total expected earnings, and one final "true-up" payment after the program cycle is completed. Under the process adopted in Decisions 07-09-043 and 08-01-042, Energy Division is required to verify the costs and installations of the energy efficiency program activities, update the ex-ante parameters used to estimate program savings and benefits, and publish a report which calculates earnings the utilities are eligible to claim. This Verification Report applies to the first interim incentives claim for the 2006-2008 program period, and covers program years 2006-2007.

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[8] Available at http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/73172.PDF and http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/78370.pdf

[9] "Utilities" or "IOUs" refer to Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas and Electric Company (SDG&E), and Southern California Gas Company (SoCalGas).

3. Policy and Procedural Background

3.1. Summary of the RRIM

This section provides an overview of the Risk/Reward Incentive Mechanism adopted by the Commission. It is intended to give the reader familiarity with the procedural background leading up to this verification report. Greater detail can be found in Decisions 07-09-043 and 08-01-042.

3.1.1. Summary of RRIM phase of EE proceeding

In Decision 04-09-060,[10] the Commission adopted numerical electricity and natural gas energy efficiency savings goals to be achieved by the utilities through the year 2013. These goals were adopted as part of the Commission's effort to achieve the objectives of the 2003 Energy Action Plan (EAP).[11] By the time the EAP was updated in October 2005,[12] the utilities had been formally established as the energy efficiency program administrators, and the California energy policy agencies had identified the adoption of a verifiable performance-based incentive mechanism that balances utility shareholder and ratepayer risk as a key action for obtaining all cost-effective energy efficiency. In September 2007, the Commission adopted a risk/reward incentive mechanism (RRIM) based on avoided cost net benefits.

A central element of the RRIM is annual verification of program accomplishments, which is accompanied by measurement of actual energy savings and demand reduction that is to be completed by the Commission's Energy Division at the end of the program cycle. Decision 08-01-042 eliminated the requirement for the utilities to pay back interim earnings if, in the final evaluation, their accomplishments fall between 65% and 85% of the Commission adopted savings goals. D. 08-01-042 also required Energy Division to use parameter estimates from the 2008 update of the Database for Energy Efficient Resources (DEER)[13] when reporting accomplishments and calculating the utilities performance for this report. The ordering paragraph establishing this requirement is provided below in its entirety.

> ***Ordering Paragraph 3 of D.08-01-042***
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> 3. For the 2006-2008 program cycle, the following *ex ante* assumptions of energy savings and demand reductions shall be used in conjunction with verified installations and verified costs to calculate the 1st and 2nd Claims:

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[10] Available at http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/40212.pdf.
[11] http://www.cpuc.ca.gov/PUC/energy/electric/Energy+Action+Plan/
[12] Energy Action Plan II, adopted by the PUC in October 2005 in collaboration with the California Energy Commission, refined and strengthened the foundation prepared by EAP I and identified further actions necessary to meet California's energy needs. EAP II continues the strong support for the loading order articulated in EAP I. The loading order describes the priority sequence for actions to address increasing energy needs and identifies energy efficiency and demand response as the State's preferred means of meeting those needs. Energy Action Plan II is available at www.cpuc.ca.gov/PUBLISHED/REPORT/51604.htm.
[13] DEER is available at http://www.deeresources.com/

a) Except as otherwise provided for below, the *ex ante* measure savings parameters that are contained in the utilities' E3 calculators, as of the 4th quarter 2007 report for the 1st Claim and as of the 4th quarter 2008 report for the 2nd Claim.

b) For measures contained in the Database for Energy Efficient Resources (DEER), the 2008 and 2009 DEER updates of *ex ante* measure savings parameters, including net-to-gross ratios and expected useful lives. The 2008 DEER update shall apply to the 1st Claim and the 2009 DEER update shall apply to the 2nd Claim.

c) For customized measures or customized projects that represent aggregated measures in the E3 calculator, Energy Division shall identify the appropriate installed measure(s) based on its measure verification results and develop the associated ex ante load impact values. For this purpose, Energy Division may use the utilities' tracking system information, engineering workpapers, DEER values and methods, or other current measurement and verification results that are available.

3.1.2. 2006-2008 Evaluation Management

In Decision 05-01-055, the Commission made the CPUC Energy Division responsible for managing and contracting for all evaluation, measurement and verification (EM&V) studies used to:

- Measure and verify energy and peak load savings for individual programs, groups of programs and at the portfolio level;
- Generate the data for savings estimates and cost-effectiveness inputs;
- Measure and evaluate achievements of energy efficiency programs, groups of programs and/or the portfolio in terms of the "performance basis" established under the CPUC-adopted EM&V protocols;[14] and
- Evaluate whether program goals are met.

In August 2007, the CPUC awarded contracts for the performance of EM&V work in 13 energy efficiency program areas. Table 1 provides a list of the EM&V projects currently managed by ED. ED staff is involved in all aspects of contract and evaluation management, providing direction and oversight of the evaluation process. The resulting evaluation reports will be used to improve the future energy efficiency programs and policy, and inform the incentives mechanism set forth in Decision 07-09-43.

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[14] Available at http://www.cpuc.ca.gov/PUC/energy/electric/Energy+Efficiency/EM+and+V/ .

Table 1: Energy Division's Program EM&V Projects

Contract	Contractor
Marketing Outreach and Information	Opinion Dynamics Corporation
Emerging Technologies	Summit Blue Consulting, LLC.
Codes & Standards and New Construction	RLW Analytics, Inc.
Residential Retrofit	The Cadmus Group, Inc.
Small Commercial	Itron
Major Commercial	SBW Consulting, Inc
Commercial Facilities	ADM Associates
Specialized Commercial	RLW Analytics, Inc.
Commercial Retro-Commissioning	SBW Consulting, Inc
PG&E Agricultural	KEMA
PG&E Industrial	Itron
Southern California Industrial And Agricultural	Itron
Local Government Partnerships	Summit Blue Consulting, LLC.

3.1.2.1. Verification Activities

Energy Division obtained measure savings data for each program from the IOU Quarterly Reports submitted to the Energy Efficiency Groupware Application (EEGA)[15] for the period 1/1/2006 through 12/31/2007. Individual measures were then categorized into measure groups for each utility. A review of this measure mapping exercise indicated that a relatively small number of measure and program combinations accounted for approximately 80% of total utility-reported annual energy and demand savings. These program/measure group combinations were referred to as *high-impact combinations*. This clustering of reported utility annual energy and demand savings around a relatively small number of high impact combinations suggested that a coordinated approach across selected evaluation Contract Groups[16] would yield robust results at the utility portfolio level in the most cost effective manner. Similarly Furthermore, due to the complexity of the data and the size of the portfolios, it was impractical for Energy Division to evaluate, update, and review for clerical error every measure for which the utilities made savings claims. Therefore, a large number of the utility programs and a modest proportion of the claimed savings have not been evaluated, and utility estimates were used in the calculations in those cases.

The Contract Groups represented by the high impact combinations include:

- The Residential Retrofit Contract Group
- The Small Commercial Contract Group
- The Major Commercial Contract Group
- The PG&E Industrial Programs Contract Group

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[15] EEGA is the Energy Division's web-based report repository accessible at http://eega.cpuc.ca.gov for 2004-2005 programs and http://eega2006.cpuc.ca.gov for 2006-2008 programs.

[16] The term "Contract Group" is used to generally refer to the 13 EM&V contracts, the contractors responsible for performing the work under those 13 contracts, and the groups of programs those contractors are responsible for.

A fifth Contract Group, the Local Government Partnerships Contract Group, was added in anticipation of a large number of CFL giveaways coordinated by Local Government Partnership programs. Because these five Contract Groups accounted for such a large fraction of the kWh, kW, and therm savings for the IOUs, the Energy Division assigned verification tasks to only these five Contract Groups.

The list of measure groups analyzed in this Verification Report is shown in Table 2. The verification reports submitted to ED by the EM&V contractors are provided in Appendix A.

Table 2: Measure Groups Defined for the First Verification Study

Residential Measure Groups	Commercial Measure Groups
Appliances	Appliances
Appliances Recycling	Cooling
Cooling	Duct seal and AC tune-up
Duct seal and AC tune-up	Exterior lighting
Exterior lighting	Food Service
Glazing and skylights	Glazing and skylights
Heating	Heating
Interior lighting	HVAC Controls
Interior screw lighting	Interior lighting
Opaque Shell	Interior screw lighting
Other	Lighting controls
Water heating	Motors
Whole building and custom	Motor controls
Water heating controls	Opaque Shell
	Other
	Process
	Refrigeration
	Retro-commissioning
	Water heating
	Whole building and custom

4. The Minimum Performance Standard and Performance Earnings Basis

4.1. Minimum Performance Standard Overview

The RRIM earnings accrue if the utility meets or exceeds the Minimum Performance Standard (MPS), a threshold of 85% of the Commission's savings goals (80% for SoCalGas). If the utility achieves 100% of the goals, the earnings rate increases as a reward for superior performance. The 85% and 100% threshold earnings rates, set at 9% and 12% respectively, are used to calculate a share of the Performance Earnings Basis (PEB), which determines the amount of shareholder incentives that the utilities will be eligible to collect in electric distribution or gas transportation rates. The PEB is an estimate of the benefits created by the utility portfolio minus the costs of the utility portfolio, measured in monetary terms.

In order to determine if the utility has met any of the MPS thresholds, each individual utility's total accomplished cumulative net annual kWh, kW, and Therms savings are calculated as a percentage of the utility-specific 2007 cumulative goals adopted in D.04-09-060. In addition to an average goal attainment for all the metrics (kWh, kW, and Therms), each individual metric alone has a threshold requirement.

The key threshold requirements for the 2006-2007 interim earnings claim from Decisions 07-09-043 and 08-01-042 are:

- If the metric average is equal to or greater than 65% and below 85% of goal (80% for SoCalGas), and each individual metric is equal to or greater than 65% of goal, then there are no earnings and no penalties.

- If the metric average is equal to or greater than 85% (80% for SoCalGas) and below 100% of goal, and each individual metric is equal to or greater than 80% of goal, then the IOU can claim 9% of PEB in earnings.

- If the metric average is equal to or greater than 100% of goal and each individual metric is equal to or greater than 95% of goal, then the IOU can claim 12% of PEB in earnings.

- If any individual metric falls to or below 65% of goal, then penalties will be applied.

4.1.1. Components Included in the MPS Calculation

The total accomplished kWh, kW, and Therm savings included in the MPS calculation are the sum of the following quantities:

1. **The 2006 and 2007 EE portfolio kWh, kW, and Therm savings accomplishments.**
   - Except as noted below, the measure level parameters are as reported in the utilities' 4th Quarter 2007 Report E3 spreadsheets.
   - Measure level parameters from the utilities' program tracking systems are used where the E3 spreadsheet line items represent aggregated measures that do not match the program tracking database line items.
   - Installation rates for which samples of installations have been inspected by ED contractors to verify proper installation have been applied to most high-impact measure/program combinations.
   - Measure level parameters from the DEER 2008 update have been applied to many high-impact measure/program combinations.
   - Realization rates have been applied to a subset of measures which utilize a "customized" approach to provide impact estimates.

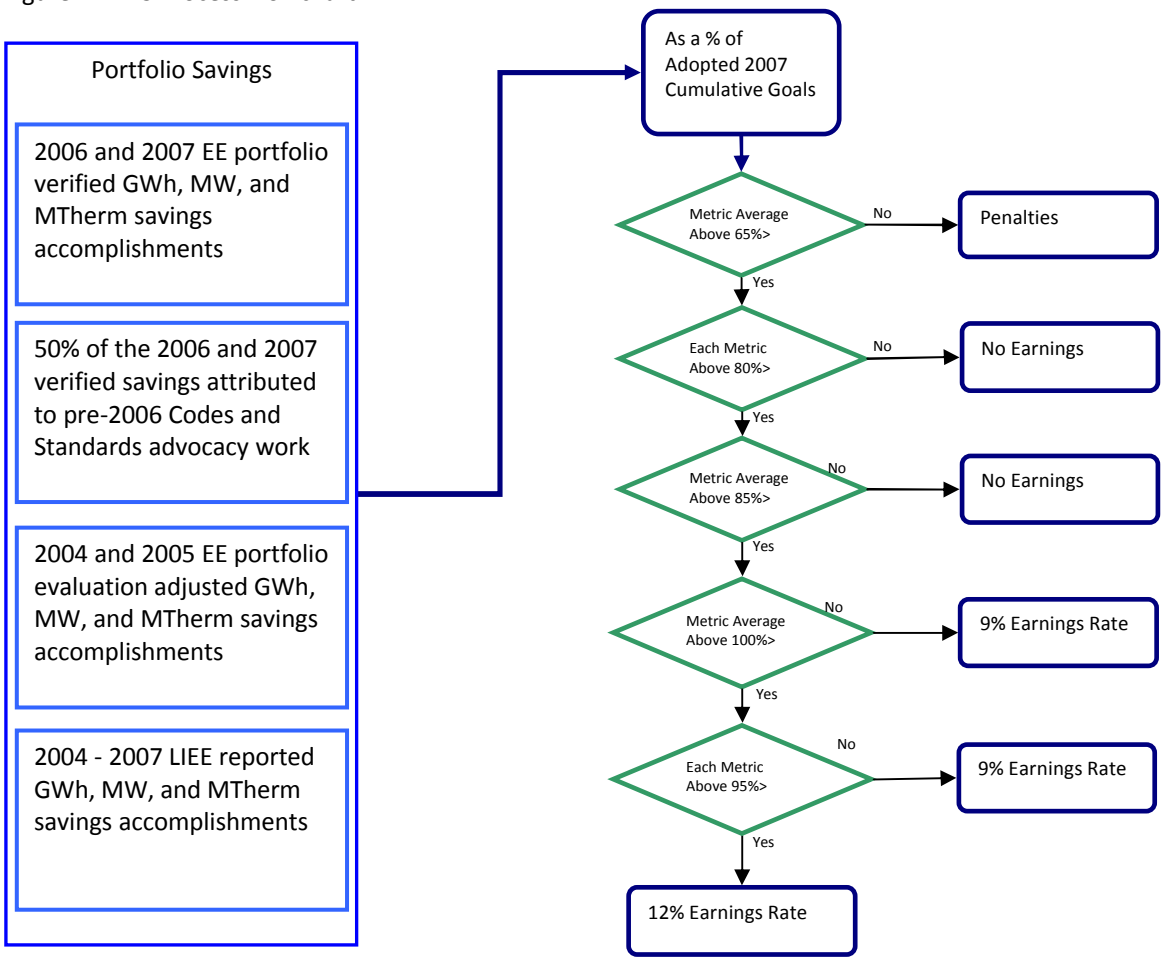
2. **50% of the 2006 and 2007 savings attributed to pre-2006 Codes and Standards advocacy work.**
   - This quantity consists of savings originally estimated by the IOUs as attributable to the codes and standards advocacy program, adjusted by the change in construction rates, the time lag in construction completion, and the effective date of appliance standards.

3. **The 2004 and 2005 EE portfolio *evaluation adjusted* kWh, kW, and Therm savings accomplishments.**
   - If an evaluation was completed, ED used the realized savings from the evaluation report.
   - If the evaluation of the program was completed, but realized savings for every program element were not explicitly provided in the evaluation report, ED applied the net realization rate in the evaluation report to the filed net savings submitted in the final EEGA reporting workbooks for that program.
   - If the evaluation of the program was complete, but a final evaluation report was not yet published, ED used the draft realized savings from the evaluation.
   - If the evaluation was not complete, ED used the filed savings in the final EEGA reporting workbooks.

4. **The 2004 through 2007 LIEE program *evaluation adjusted* GWh, MW, and MTherm savings accomplishments.**
   - PY 2005 savings come from the 2005 LIEE evaluation report.
   - The savings data for 2004, 2006, and 2007 comes from IOU LIEE reports filed with the CPUC.

The MPS process is illustrated in Figure 1.

Figure 1: MPS Process Flowchart



4.2. Performance Earnings Basis Overview

The PEB is a representation of net program benefits. The PEB is calculated by combining two-thirds of the Total Resource Cost (TRC) net benefits and one-third of the Program Administrator Cost (PAC) net benefits. The TRC and PAC are cost-benefit analysis methodologies commonly used for evaluating utility sector Demand-Side Management programs. The TRC and PAC costs include program administrative costs. The TRC additionally includes the costs incurred by program participants. The TRC and PAC benefits include estimates of supply-side costs avoided by the implementation of energy efficiency programs.

4.2.1. Components Included in PEB Calculation

All program costs and benefits are included the PEB calculation, with a few exceptions. Commission policy excludes certain costs and benefits that are either used only for measuring the MPS thresholds, are not measured through the evaluation process, or are

excluded in order to encourage desired program activities which do not produce avoided cost benefits that can be directly measured and attributed. The following exceptions apply to the PEB costs and benefits:

1. The costs for the Emerging Technologies programs are not counted in the calculation of TRC and PAC costs.
2. The savings and costs attributed to pre-2006 Codes and Standards advocacy work are not counted in the calculation of TRC and PAC benefits.
3. The savings and costs for Low Income Energy Efficiency (LIEE) programs are not counted in the calculation of TRC and PAC costs or benefits.
4. The EE shareholder incentive earnings are not counted in the calculation of TRC and PAC costs.
5. Participant spillover, market effects, and most indirect impacts are not counted in the calculation of TRC and PAC benefits.
6. All other costs and avoided cost benefits are included the calculation of TRC and PAC net benefits.

4.3. Summary of the TRC and PAC Calculations

The TRC and PAC net benefits are calculated as described in the Standard Practice Manual,[17] and as clarified in D.06-06-063[18] issued in Rulemaking 04-04-025, the 12/21/2006 AL>Ruling[19] issued in R.06-04-010, and modified for a "free-rider-adjustment" in D.07-09-043 issued in R.06-04-010. The TRC and PAC tests, and their application to the PEB calculation, are described in the Energy Efficiency Policy Manual, Version 4.0.[20] In summary, the TRC and PAC tests convert electric and gas energy and electric demand savings to monetized avoided cost benefits, and produce (using program administrative costs and program participant costs) benefit/cost ratios and monetized net benefit values.

The TRC and PAC methodologies specify how EE portfolio costs and benefits are calculated. All costs and benefits are specified to be calculated as the sum of the cost and benefit for each measure installed within an EE cycle as a result of the utilities' energy efficiency portfolio activities. The primary costs and benefits included in the TRC test are as outlined in Figure 2. The PAC benefits are equal to the TRC benefits but the PAC costs do not include any participating customer costs.

The TRC and PAC tests are calculated in a customized Excel spreadsheet known as the "E3 Calculator." The E3 Calculator performs the TRC and PAC cost/benefit calculations using the following data.

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[17] Available at http://www.cpuc.ca.gov/PUC/energy/electric/Energy>Efficiency/EM>and>V/

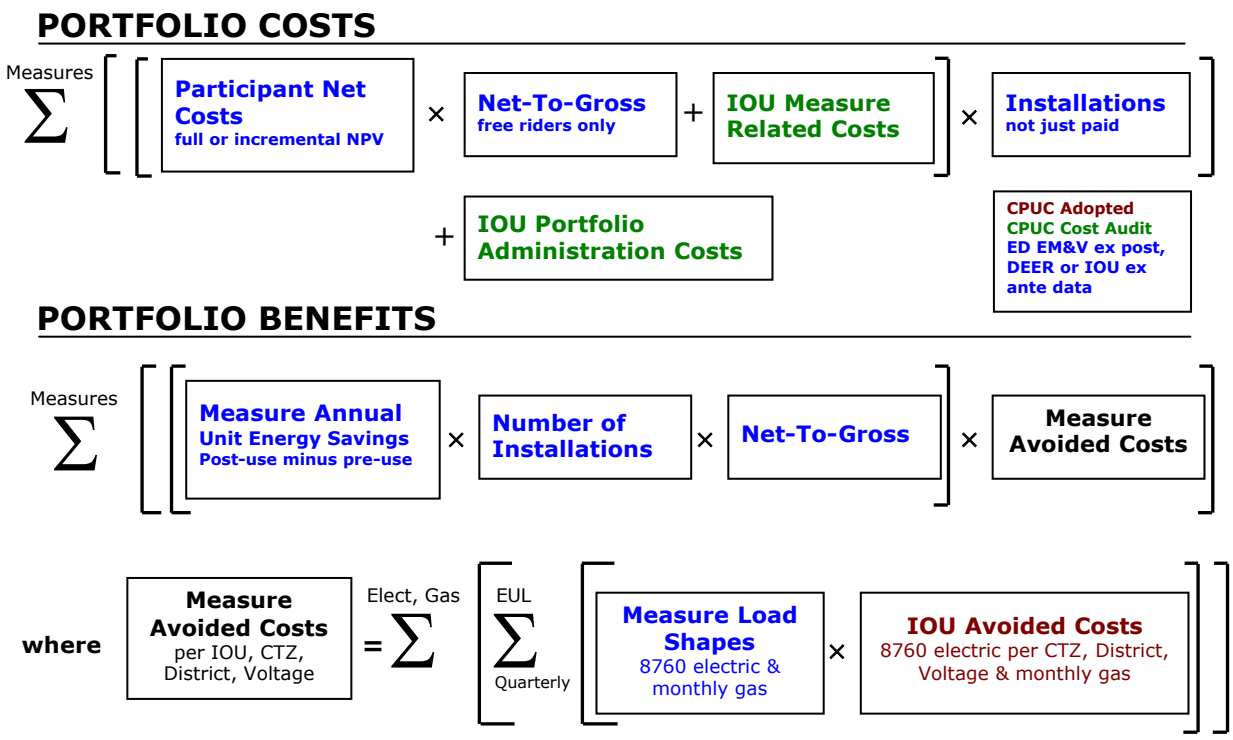
[18] http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/57756.htm

[19] http://docs.cpuc.ca.gov/EFILE/RULINGS/63120.htm

[20] http://docs.cpuc.ca.gov/EFILE/RULINGS/80684.htm

1. **Avoided Costs** – The latest Commission adopted values; most recently updated by D.06-06-063.
2. **Portfolio Administration Costs** – The total costs incurred to implement the utility programs, including measure costs such as rebates and other incentives (mid/upstream incentives and direct install costs).
3. **Measure Data** – All the measure specific parameters used in the TRC calculation outlined in the 1/2/2007 AL>Ruling[21] issued in R.06-04-010.

Figure 2: TRC Benefits and Costs



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[21] http://docs.cpuc.ca.gov/EFILE/RULINGS/63294.htm

5. Overview of Data Used to Calculate MPS and PEB

5.1. 2006-2007 EE Data

The Energy Division relied on six primary sources of data to calculate the 2006-2007 program savings and benefits:

1. ***Program Tracking Data***
2. ***E3 Calculators***
3. ***Database for Energy Efficiency Resources***
4. ***Utility Work Papers***
5. ***Hardcopy Project Files***
6. ***Installation Rates from EM&V Contractor Verification Reports***

5.1.1. Program Tracking Data

The term "program tracking data" is generically used to refer to the elementary underlying information on program measures installed and rebated through the utility energy efficiency programs. Each utility has different systems and procedures for managing program related data. The program tracking databases contain detailed information on program participants and specific energy efficiency projects. Since the evaluators required facility-level customer specific information in order to design sampling plans for completing physical inspections of installations, the tracking data was used as the sample frame for most of the field verification activities.

5.1.2. E3 Spreadsheets

The utilities use the E3 calculator to calculate energy savings, demand reduction, and cost-benefit estimates on both a prospective (forecasting) basis and a retrospective (reporting) basis. The savings and cost-benefit calculations are based on measure level data, which is entered into the "input" sheet of the E3 calculator. The measure level data is used to calculate avoided cost benefits using the Commission-approved hourly avoided cost data.

In most cases, the line items in the E3 input sheet represent aggregations of cases from the program tracking databases, as can be seen in Table 3.[22] All measures listed in the E3 calculators should be reconcilable to the program tracking databases. In total, there are 212 E3 calculators, 136 of which actually report energy savings measures, resulting in 11,158 rows of measures.

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[22] It should be noted that ED believes the utilities continue to be out of compliance with the 2/21/2006 AL>ruling issued in R.01-08-028 and the 8/8/2007 AL>ruling issued in R.06-04-010, both of which require the utilities to report measure level data that is not aggregated in any way in their quarterly reports.

Table 3: Comparison of E3 Spreadsheet and Program Tracking Database Data

Utility	E3 Rows	Tracking DB Rows	Program Tracking Data Source Table
PGE	2,758	740,027	PGE_Frozen_Data_030108
SCE	7,717	1,278,526	tblProgramTrackingData
SDGE	544	166,231	CS1TM10_MSRS
SCG	139	178,953	CS1TM10_MSRS
Total	11,158	2,363,737	

The utilities are required to submit the E3 calculator inputs, calculation results, and calculation engines each quarter as part of their quarterly reports to ED. To avoid confusion, the E3 calculator inputs and results are referred to as the "E3 spreadsheet" throughout this report. The Excel tools that perform the savings and net benefits calculations are referred to as "E3 calculator" or "E3 calculator engine" throughout this report. For the 2006-2007 period, the Commission ruled in D.08-01-042 that the measure savings parameters in the utilities' E3 calculators submitted with the 4th quarter 2007 report are the ex-ante values to be used in conjunction with verified installations and verified costs to calculate the utilities' earnings claim.[23&24]

Table 4 lists the sources of the E3 calculator input/output files used for the 2006-2007 period.

Table 4: Source E3 Spreadsheets

ID	Utility	Report Name	Version	Report Period	Uploaded
978	SDGE	E3 calcs (from SDGE site).zip	1	Q4 2007	4/25/08
779	PGE	4Q07 E3 Calculators.zip	1	Q4 2007	3/3/08
819	SCE	SCE 4th Quarter 2007 E3 Calculators.zip	1	Q4 2007	3/10/08
975	SCG	E3 calcs (from SCG site).zip	1	Q4 2007	4/25/08

For the purposes of calculating the PEB, ED has updated parameters at either the tracking level of data or the E3 level of data.

It should be noted that the calculations of the TRC and PAC are derived from the utility specific E3 calculator engines identified in Table 5.

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[23] Ordering Paragraph 3 of D.08-01-042, provided in section 3.1.1.

[24] All of the E3 spreadsheets can be found under the "Quarterly Reports" link on http://eega2006.cpuc.ca.gov

Table 5: Source E3 Calculator engines[25]

Utility	File Name	Source
PGE	PG&E Tool 4c.zip	http://www.ethree.com/downloads/E3%20Calculators/PG&E%20Tool%204c.zip
SCE	SCE Tool 4b (1000).zip	http://www.ethree.com/downloads/E3%20Calculators/SCE%20Tool%204b%20(1000).zip
SDGE	SDG&E Tool 4b (800).zip	http://www.ethree.com/downloads/E3%20Calculators/SDG&E%20Tool%204b%20(800).zip
SCG	SoCal Tool 4b (800).zip	http://www.ethree.com/downloads/E3%20Calculators/SoCal%20Tool%204b%20(800).zip

5.1.3. Database for Energy Efficiency Resources

As part of the ex-ante update required by Decision 08-01-042, Energy Division is using the latest MPS and PEB parameter values from the 2008 DEER Update for measures included in the DEER database. DEER is a database of Net-to-Gross (NTG), Effective Useful Life (EUL), and Unit Energy Savings (UES) values for standard or "deemed" energy efficiency measures. Deemed measures are energy efficiency projects and technologies that are relatively simple to analyze and evaluate, and do not vary tremendously with individual projects. Measures whose performance varies significantly due to the specifics of the individual projects are categorized as "custom" measures and are not currently covered by DEER UES values, however, DEER NTG and EUL values are to be utilized for those measures.

NTG values are drawn from the most recent and/or applicable program evaluation studies. EUL values are based on a variety of sources including recent evaluation studies, utility workpapers, and various industry-specific data. UES values in DEER are generated using industry-standard building simulation software and engineering algorithms. Engineering algorithms are based on industry-standard engineering assumptions, originating from the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)[26] or other professional societies.

All of the studies, algorithms, assumptions, and building simulation tools are open source and available for review. The data sources, analytical approach documentation, user documentation, and user tools can be downloaded from the DEER web site.[27] The methods for applying the DEER update results to measures listed in the program tracking systems and E3 calculators are described in Section 6.2 of this report.

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[25] It should also be noted that these E3 Calculator versions contain discount rates not consistent with CPUC policy as noted in below; these were not changed and thus the net-benefits for all IOU will be larger than use of the correct value would provide.

Utility	E3 spreadsheet discount rate	CPUC directed value
SDG&E	7.49%	8.5%
PG&E	7.49%	8.79%
SCE	7.49%	8.75%
SCG	7.49%	8.68%

[26] http://www.ashrae.org/
[27] http://www.deeresources.com/

5.1.4. Utility Workpapers

The ex-ante savings assumptions for project-dependent custom measures are documented in utility workpapers.[28] Ordering Paragraph 4 of the 12/21/2006 AL>Ruling requires the utilities to submit workpaper documentation on a quarterly basis that shows how the savings values are calculated for custom measures.

In most cases, the utility workpaper values have been used in ED's MPS and PEB calculations. Exceptions to this rule are described in Section 6.5.

5.1.5. Hardcopy Project Files

In addition to the program tracking databases, the utilities maintain hardcopy paper records of the more complex energy efficiency projects and contracts. For sampled projects, it was essential to review the hardcopy project files in order to fully understand the project details, plan on-site inspections, and conduct analyses of data collected in the field.

5.1.6. Installation Rates from EM&V Contractor Verification Reports

ED authorized the EM&V Contract Groups in Table 6 to conduct verification studies of measure installations during the 2006-07 period:

Table 6: Contract Groups Responsible for Performing Verification Studies

Contract Group
Residential Retrofit
Small Commercial
Major Commercial
Local Government Partnerships
PG&E Industrial

The EM&V contractors conducted on-site inspections and surveys on sampled participants and non-participants to verify whether the measures recorded in the program tracking systems were actually installed and operational in the field. The outputs of this on-site and survey work are installation rates, which represent the ratio of measure counts observed in the field over measure counts reported in the program tracking databases. Installation rates are used to adjust the installation counts for populations of measures from which samples were drawn. Installation rates constitute one of the key adjustments made by ED in calculating the MPS and PEB.

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[28] All of the workpapers can be found under the "Quarterly Reports" link on http://eega2006.cpuc.ca.gov.

The methods for obtaining installation rates through on-site inspections and surveys are discussed in detail in the verification reports submitted to ED by the EM&V contractors, provided in Appendix A. The methods for applying the installation rates to adjust the installation counts for populations of measures from which samples were drawn are discussed in section 6.3 of this report.

5.2. 2004-2005 EE Data

5.2.1. Methodology for compiling evaluated 2004-2005 savings

Resource acquisition programs implemented in the 2004-2005 cycle were subject to impact evaluations. Evaluation contractors were hired by the utilities starting in 2004 and final evaluation plans were approved by Energy Division staff. Program evaluations were conducted and the draft evaluation results were reviewed by the utilities, Energy Division staff, and Energy Division consultants. After considering input from all parties and making necessary revisions and edits, final evaluation reports were approved by Energy Division staff and posted on the California Measurement Advisory Council website (www.calmac.org), managed by the IOUs for the purpose of warehousing evaluation reports.

Each program evaluation was required to report realized annual electric and gas savings and demand reduction for 2004 and 2005 in an "Impact Reporting Table." The Impact Reporting Table follows a standardized format and is included in each final evaluation report, with a few exceptions.

To compile the evaluated savings for 2004-2005, the following rules were employed:

A. If an evaluation was completed, the realized savings from the evaluation report was used.
B. If the evaluation of the program was completed, but realized savings for each program funding component (PGC or Procurement) were not explicitly provided in the evaluation report, ED applied the net realization rate in the evaluation report to the filed net savings submitted in the final EEGA reporting workbooks for that program.[29]
C. If the evaluation of the program was complete, but a final evaluation report was not yet published, Energy Division used the draft realized savings from the evaluation.
D. If the evaluation was not complete, the filed savings in the final EEGA reporting workbooks were used.

A - Programs with completed evaluations

Appendix B provides a list of programs and links to all evaluation reports and workbooks that were used in this estimate of evaluated savings.

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[29] Available at eega.cpuc.ca.gov. Click "View Public Reports," check disclaimer box, click "view all programs" or select from menus, final report workbooks are located under the column heading "File Name."

B - Programs with completed evaluations that did not report realized savings

Annual savings for the ten programs in Table 6 were not specifically cited in the final evaluation reports. The filed savings were adjusted by the net realization rates reported in the evaluations. The spreadsheet in Appendix C contains the entire calculations ED used to apply the realization rates in the Table 6.

Table 6: Programs for which Realized Savings were not Explicitly Provided in the Evaluation

Program ID	Utility	Funding	Program Name	Realization Rate Applied to Filed Savings	Source
1176-04	SCE-PROC	Proc	SW-MF Rebate	0.32 kWh 0.31 kW 0.15 Therms	Evaluation of the 2004-2005 Statewide Multifamily Rebate Program Evaluation – Vol 1. KEMA, March 16, 2007. Table 1-4 >Measured Savings>% of reported accomplishments, Net kW, kWh, Therms pg. 1-9
1509-04	SDG&E-PROC	Proc			
1169-04	SCE	Proc	SW-CAEnergySTAR Homes	0.90 kWh 0.76 kW	Evaluation, Measurement, and Verification of the 2004&2005 California Statewide ENERGY STAR New Homes Program, RLW Analytics; >uly 18, 2007. Table 2 pg 14; SCE Net Ex ante to Net ex-post realization rate (combined SF, MR, Hi rise)
1325-04	SCE	PGC	Bakersfield Kern Partnership – SCE and SCG	Residential 0.79 kWh 0.69 kW Commercial 0.46 kWh 0.78 kW	PG&E 2004-05 Local Government Partnership Programs December 12, 2006; EcoNorthwest Bakersfield Kern Results - Table 30 and 32 (Residential); Table 50 and 52 (Commercial.)
1230-04	SCG	PGC			
1520-04	SDG&E-PROC	Proc	Small Business Energy Efficiency	0.83 kW 0.49 kWh	Evaluation of the SDG&E 2004-05 Small Business Energy Efficiency Program April 20, 2006; EcoNorthwest; Table ES-7
1377-04	SDG&E	Proc	Single-Family EE Rebates - SDGEProc	Lighting 0.47 kWh 0.23 kW Non-Lighting 0.52 kWh 0.51 kW 0.37 therms	2004/2005 Statewide Residential Retrofit Single-Family Energy Efficiency Rebate Evaluation, Itron, October 2, 2007. Page 11-10
1160-04	SCE	Proc	Single-Family EE Rebates - SCEProc		
1505-04	PG&E	Proc	Residential EE		
1453-04	SCE	Proc	Small Nonresidential Hard to Reach Program	0.48 kWh 0.75 kW	Evaluation of the SCE 2004-05 Small Business Energy Connection Program, April 2, 2007; EcoNorthwest Table ES-6

C - Programs with only draft evaluation results

As of November 17,′ 2008, the impact evaluation report for the Express Efficiency and Upstream HVAC and Motors programs has yet to be completed, but draft savings results are available. These programs represent about 18% of the expected kWh savings for the 2004-2005 program cycle. The program IDs are provided in Table 7.

Table 7: Programs Where the Impact Evaluation Is Not Yet Completed

Program IDs	Utility	Funding	Program Name

1133-04,1178-04, 1243-04,1251-04, 1344-04,1503-04	PG&E,SCE, SCG,SDG&E	PGC and Proc	Express Efficiency
1120-04, 1179-04 1334-04, 1508-04	PG&E, SCE SDG&E	PGC and Proc	Upstream HVAC and Motors

D - Programs without completed evaluations

The Program evaluation for VeSM (SCE1502-04) is still pending. This program represents less than 1% of the expected savings for the 2004-2005 program cycle.

5.2.2. 2004-2005 Savings Results

Based on the rules outlined above, Table 8 was developed. The full spreadsheet used to generate Table 8 is provided in Appendix D. The first column represents the 2004-2005 cumulative savings that were filed by the utilities via workbooks posted on the EEGA website. The second column represents the cumulative savings provided in the evaluation reports, with the exceptions noted in the preceding text.

Table 8: 2004-2005 Cumulative Savings Estimates

	Ex-Ante EEGA Workbooks	Ex-Post Evaluation Results
PG&E		
GWh-Annual	1,736.40	907.04
MW	335.5	193.58
MMTherm - Annual	44.1	18.35
% GWh Goal	**117%**	**61%**
% MW Goal	**104%**	**60%**
% MMTherm Goal	**225%**	**94%**
SCE		
GWh-Annual	1,923.10	1079.54
MW	579.7	204.87
% GWh Goal	**116%**	**65%**
% MW Goal	**174%**	**61%**
SDG&E		
GWh-Annual	611.9	365.82
MW	115.5	63.98
MMTherm-Annual	8.9	4.40
% GWh Goal	**114%**	**68%**
% MW Goal	**115%**	**64%**
% MMTherm Goal	**247%**	**122%**
SCG		
MMTherm-Annual	26.1	11.1
% MMTherm Goal	**135%**	**58%**

5.2.3. Accounting for savings realized after 2005 (Commitments)

A handful of programs have EEGA reported annual savings estimates that increase after 2005. This appears to be due to program extensions, late start-ups, and projects that were implemented after the 2005 programs closed. Table 9 lists the programs for which the reported annual savings estimates are realized after 2005.

Table 9: Programs for which Annual Evaluated Savings are Greater in 2006 than in 2005

Programs	Utility	Funding	Program Name
1066-04	SCE	PGC	H&L Energy Savers - Performance4
1085-04	PG&E	PGC	Small Business Energy Alliance
1086-04	SCE	PGC	Small Business Energy Alliance
1487-04	SCG	PGC	ADM Mobile Energy Clinic
1285-04	SDG&E	PGC	B.E.S.T – SDREO
1301-04	SDG&E	PGC	San Diego Region Local Government Energy Efficiency
1311-04	SCE	PGC	Residential Duct Services
1327-04	SCG	PGC	Residential Duct Services
1381-04	SDG&E	PGC	Retrocommissioning Program
1500-04	SDG&E	PGC	Rebuild a Greener San Diego
1383-04	SDG&E	PGC	San Diego City Schools Retrofit Partnership
1320-04	SDG&E	PGC	Local Nonresidential Customer Energy Savings Bid
1121-04	PG&E	PGC	Standard Performance Contract – PGE
1347-04	SDG&E	PGC	Standard Performance Contract – SDGE

To correct for this, and give the utilities credit for annual energy savings that were achieved via 04-05 funding, the annual savings reported after 2005, which includes all the savings attributable to 04-05 activities, are counted instead of the savings reported only through 2005.

Note Table 10 for example. The cumulative annual savings for 04-05 activities is reported for Express Efficiency in the year 2005; for Residential Duct Services and SPC the total annual savings attributable to the 04-05 activities is achieved in 2006 and 2008 respectively.

Table 10: Examples of Savings Realized After 2005

				2004	2005	2006	2007	2008	2009
1133-04	PG&E	Express – PGE	MWh	30,137	**72,027**	72,027	71,867	58,655.52	36,403
1327-04	SCG	RDS	MWh	99	2,095	**2,181**	2,181	2,181	2,181
1121-04	PG&E	SPC – PGE	MWh	18,699	81,602	94,449	150,041	**150,371**	150,358

5.3. 2004-2007 LIEE Data

The LIEE data used to calculate the IOU portfolio savings for 2005 come directly from table E3 of the "Impact Evaluation of the 2005 California Low Income Energy Efficiency Program Final Report."[30] The savings data for 2004, 2006, and 2007 come directly from the IOU annual LIEE reports filed with the CPUC.[31] After analyzing the annual LIEE reported claims and the 2005 LIEE evaluation report, Energy Division concluded that the effort required to adjust the claimed savings using the 2005 LIEE evaluation report in a valid manner was not possible for this interim report.

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[30] Available at http://www.liob.org/docs/LIEEPY05FinalReport1-10-08.pdf

[31] Available upon request

Demand impacts were not required and therefore not reported for 2004 and 2005 LIEE programs. Energy Division staff extrapolated demand impacts for those years by calculating the average ratio of demand over energy impacts for 2006 and 2007, and used that ratio to estimate the 2004 and 2005 demand impacts. Table 11 provides the savings numbers used for the LIEE programs.

Table 11: 2004-2007 LIEE Program Savings

PG&E	GWh	MW	MMTherms
2004	20.13	4.14	0.87
2005	24.68	4.59	1.03
2006	27.92	6.01	1.45
2007	27.55	5.41	1.21

SCE	GWh	MW	MMTherms
2004	15.29	3.32	N/A
2005	18.00	2.92	N/A
2006	26.76	5.81	N/A
2007	21.14	4.59	N/A

SDG&E	GWh	MW	MMTherms
2004	6.89	1.79	0.26
2005	4.64	0.80	0.15
2006	5.31	1.98	0.28
2007	4.43	0.65	0.22

SoCalGas	GWh	MW	MMTherms
2004	0.13	N/A	1.03
2005	0.38	N/A	0.71
2006	0.27	N/A	0.83
2007	0.00	N/A	0.89

5.4. Pre-2006 Codes and Standards Advocacy

An Energy Division contractor performed an initial verification of the energy savings estimated to have resulted from the Pre-2006 Codes and Standards advocacy program. The EM&V verification report is provided in Appendix H. The verification for this report consisted of adjusting the savings originally estimated by the utilities by taking into account the change in construction rates, the time lag between when a permit is issued and construction is completed, and the effective date of appliance standards. Resulting adjustments to MPS metrics ranged from 72% for SCE MW to 109% for all therm savings realized in 2007. The claimed and adjusted savings numbers are provided in Tables 12 through 14

Table 12: Interim Adjusted and Claimed Codes and Standards Advocacy Electricity Savings, GWh

Year	Utility	Title 20		Title 24		Total		
		Claimed	Adjusted	Claimed	Adjusted	Claimed	Adjusted	% of Claimed
2006	PG&E	23.7	21.4	14.2	12	37.9	33.4	88%
	SDG&E	5.6	5	3.3	2.8	8.9	7.8	88%
	SCE	24.5	22.2	19.8	10.6	44.3	32.8	74%
	SCG	NA	NA	NA	NA	NA	NA	NA
2007	PG&E	23.7	22.8	15.4	12.9	39.1	35.8	91%
	SDG&E	5.6	5.3	3.6	3	9.2	8.4	91%
	SCE	25.7	24.7	18.4	11.8	44.1	36.5	82%
	SCG	NA	NA	NA	NA	NA	NA	NA

Table 13: Interim Adjusted and Claimed Codes and Standards Advocacy Demand Savings, MW

Year	Utility	Title 20		Title 24		Total		
		Claimed	Adjusted	Claimed	Adjusted	Claimed	Adjusted	% of Claimed
2006	PG&E	3.5	3.3	7.5	6.4	11	9.7	88%
	SDG&E	0.8	0.8	1.8	1.5	2.6	2.3	88%
	SCE	3.8	3.5	8.6	5.4	12.4	9	72%
	SCG	NA	NA	NA	NA	NA	NA	NA
2007	PG&E	3.7	3.6	8.2	6.5	11.9	10.1	85%
	SDG&E	0.9	0.8	1.9	1.5	2.8	2.4	85%
	SCE	4.2	4.1	8	5.6	12.2	9.7	80%
	SCG	NA	NA	NA	NA	NA	NA	NA

Table 14: Interim Adjusted and Claimed Codes and Standards Advocacy Natural Gas Savings, MMtherms

Year	Utility	Title 20		Title 24		Total		
		Claimed	Adjusted	Claimed	Adjusted	Claimed	Adjusted	% of Claimed
2006	PG&E	0.6	0.6	0.4	0.4	0.9	1	96%
	SDG&E	0.1	0.1	0	0	0.1	0.1	96%
	SCE	NA	NA	NA	NA	NA	NA	NA
	SCG	0.9	0.9	0.6	0.7	1.5	1.6	105%
2007	PG&E	0.5	0.5	0.3	0.4	0.8	0.9	109%
	SDG&E	0.1	0.1	0	0	0.1	0.1	109%
	SCE	NA	NA	NA	NA	NA	NA	NA
	SCG	0.8	0.8	0.5	0.7	1.3	1.5	109%

5.5. 2006-2007 Audited Costs

An audit of the utilities' 2006-2007 energy efficiency costs resulted in the allowance of all cost items. Although the audit report identified a number of potential problems, these were not significant enough to warrant adjustments to the utilities' cost claims.

The absence of disallowances means that the results of this audit will not have an impact on the calculation of the PEB. The TRC and PAC calculations are therefore conducted with utility reported cost provided in the E3 calculators. The CPUC audit staff are working with the utilities to agree on public version of the report.

6. Methodology for Calculating 2006-2007 Savings and Benefits

The total EE portfolio consists of 136 programs that report savings, totaling over eleven thousand measures in the E3 spreadsheets and over 2.3 million records in the program tracking databases. In order to calculate the 2006 – 2007 savings, as directed in D.08-01-042, Energy Division replaced certain utility claimed values with new values derived from the EM&V field and survey work or the 2008 DEER update. This is referred to as "update" or "DEER update" throughout this report and is not to be confused with the process that resulted in the 2008 DEER Update values. To make this update process manageable, Energy Division limited the DEER updates to the 13 programs that were part of the verification study and together comprised approximately 76% of the portfolio impacts. Furthermore, the measures within these programs were only updated if they were part of the verification sample. As a rule, all other measures and all other programs have been "passed through" in the VRT (see 6.1, below), meaning that the utility-reported values in the E3 spreadsheet for these measures and programs were used in the final calculation of the PEB without modification. Within these program and measure combinations, a set of measure groups have been defined and selected for the verification study, as such, measures categorized within these measure groups were updated in the VRT.

Tables 15 and 16A list the programs and measures that were part of this update. Table 16B provides the proportion of savings updated by this report. An excel workbook providing the measure group definitions is provided in Appendix L.

Table 15: Programs updated in this report (The numbers below are utility reported savings)

Program ID	Program Name	GWH	%	Cum %	MW	%	Cum %	MM TH	%	Cum %
PGE2000	Core Mass Market RES	933	18%	18%	146	17%	17%	4	6%	6%
PGE2004	Fabrication, Industrial, Manufacturing	114	2%	21%	14	2%	19%	13	18%	24%
PGE2080	Core Mass Market NRES	822	16%	37%	170	20%	38%	6	8%	32%
SCE2501	Residential Energy Efficiency Incentives	1211	24%	61%	164	19%	57%			32%
SCE2511	Nonresidential Direct Installation	205	4%	65%	36	4%	62%			32%
SCE2517	Business Incentives & Services	437	9%	73%	78	9%	71%			32%
SCG3507	Express Efficiency Rebate Program			73%			71%	14	21%	52%
SCG3513	Local Business Energy Efficiency			73%			71%	9	13%	65%
SDGE3010	Energy Savings Bids	59	1%	74%	9	1%	72%	1	2%	67%
SDGE3012	Express Efficiency	38	1%	75%	7	1%	72%	1	1%	67%
SDGE3016	Upstream Lighting	204	4%	79%	18	2%	75%			67%
SDGE3020	Small Business Super Saver	144	3%	82%	30	3%	78%	1	1%	68%
SDGE3025	Standard Performance Contract	13	0.3%	82%	2	0%	78%	0	0.3%	69%

Table 16A: Measure Groups updated in this report

PGE	SCE	SDGE	SCG
Upstream Res Interior screw lighting	Upstream Res Interior screw lighting	Upstream Res Interior screw lighting	C&I Steam trap
Upstream C&I Interior screw lighting	Upstream C&I Interior screw lighting	C&I Linear fluorescent	C&I Process - unknown
C&I Process - unknown	C&I Linear fluorescent	C&I Lighting - measure unknown	C&I Pipe and tank insulation
C&I Interior screw lighting	Res Recycle refrigerator	C&I Cooling - measure unknown	C&I Process boiler
C&I Strip curtain	C&I Process - unknown	C&I High bay fluorescent	C&I Greenhouse heat curtain

Table 16B: Measure Groups updated in this report

	Lifecycle Net kWh	User Entered kW	Lifecycle Net Therms
PGE	77%	84%	75%
SCE	75%	76%	
SDGE	84%	67%	62%
SCG			64%
All	**77%**	**78%**	**69%**

6.1. Verification Reporting Template (VRT)

The VRT is a Microsoft (MS) Access application developed by ED. The VRT was developed to allow Energy Division to calculate the MPS and PEB in an efficient, transparent, and repeatable manner. This application is used to compile and process two types of data:

A. **IOU savings and cost claims**. These were submitted as standard E3 spreadsheets for each program, covering all 2006-08 program activities through December 31, 2007. These E3 spreadsheets list savings and related parameters for each measure line item in the >input>sheet of each workbook. They also document program level savings, costs and net benefits. All data from all E3 spreadsheets were compiled and are part of the VRT application. The utilities submitted 212 E3 spreadsheets, covering activity for 210 programs.[32] One hundred and thirty six of these programs claimed savings. E3 spreadsheets were submitted for the other programs in order to document program costs.

B. **Program tracking data**. The VRT establishes a standardized program-tracking level data format. The format includes three types of data fields: IOU E3, IOU Program Tracking, and ED Update. For selected programs (that account for a combined 76% of the total portfolio savings claim), data records were compiled at the program tracking level, starting with the IOU program tracking submittals for 2006-07 and adding data from the matched IOU E3 spreadsheets and data developed by ED for adjusting installation rates, NTG, EUL and UES.

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[32] The E3 Calculator used by each IOU support a maximum number of measure line items on the >input>sheet. The number varies across the versions for each IOU.

The VRT application supports the following verification activities:

A. **Automated E3 Runs**. Using either input line items from the E3 spreadsheets or program tracking records, the VRT can run the approved[33] E3 calculator engines. As each program is run, the savings and net benefits results are accumulated.

B. **Portfolio Summary**. The VRT can summarize savings and net benefits across all runs, by IOU, and place these results in the RRIM calculator.[34]

Please refer to the VRT User's Manual in Appendix F for instructions on how to use the VRT to perform the Automated E3 runs and Portfolio Summary activities listed above. The full VRT and associated files are provided in Appendix G.

There are many parts to the VRT, but the core process involves a few key steps that are described in the following sections:

A. Populating the VRT with all Measures to be Updated *(section 6.2)*

B. Updating Measures in the VRT with Installation Rates and DEER Parameters *(section 6.3)*

C. Running the VRT to Calculate Adjusted Energy Savings and PEB Values *(section 6.4)*

These sections describe the methods used to calculate the utilities' savings and net-benefits using installation rates produced by the EM&V contractor's field and survey work, and using the 2008 DEER values for UES, NTG and EUL. Figures 3 through 6 illustrate this process at a high level. Each step is described in more detail below.

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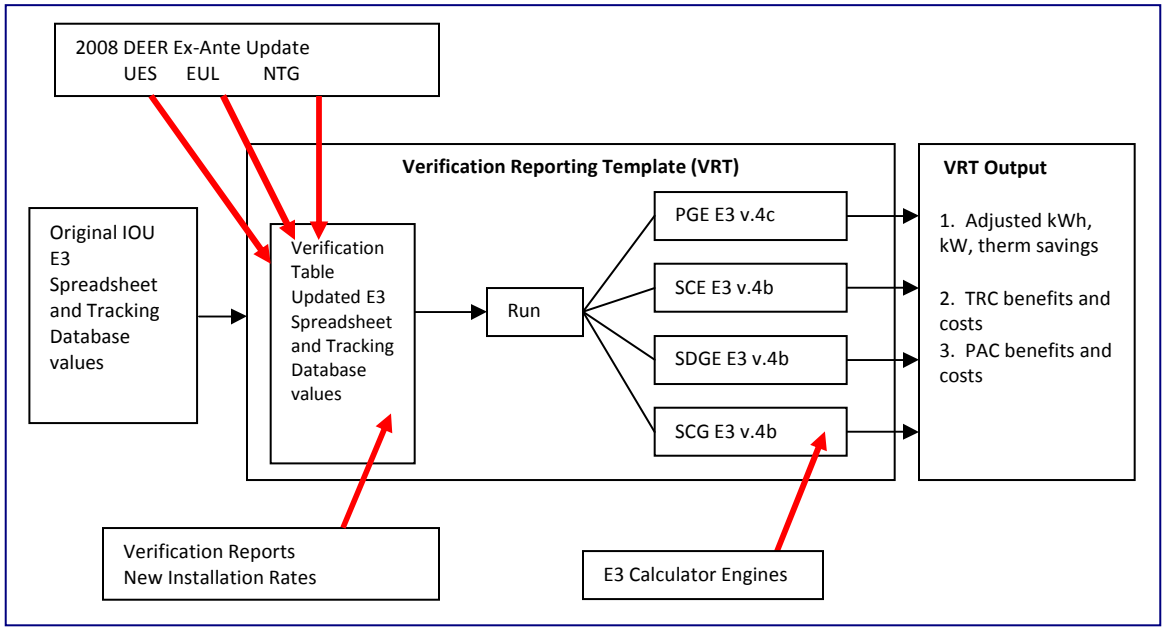
[33] E3 Calculators in Compliance with Decision 07-09-043. Updated 9/22/08.

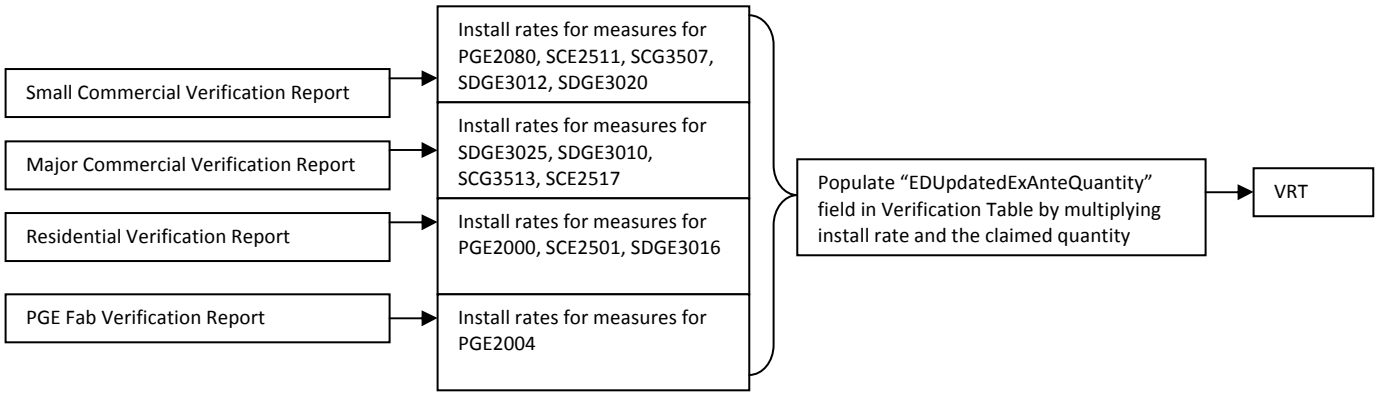
[34] The RRIM Calculator is described in Section 7 of this report and is provided as part of Appendix G.

Figure 3: VRT Process Flow Chart



The box labeled "Verification Reports – New Installation Rates" in Figure 3 is examined in more detail in Figure 4 below. The measure group specific installation rates were derived from the contractor verification studies and applied to the measures that comprise the programs selected for this update. The installation rates found in the verification studies may differ from the installation rates used in the VRT due to differences in how clerical errors found in the utilities program tracking databases and E3 spreadsheets were treated in the EM&V contractor verification studies. Finally the installation rates were applied to the corresponding measures in the Verification Table of the VRT. Once this was done, the VRT calculations were based on the ED updated installation counts that were adjusted by the installation rates.

Figure 4: Installation Rate to VRT flow chart



The box labeled "2008 DEER Ex-Ante Update - UES EUL NTG" in Figure 3 above is examined in more detail in Figures 5 and 6 below. The 2008 DEER Update UES values were compiled into a database referred to as the "Interim Database." The Interim Database was used to match UES values to specific measures. Once the matching of UES to measures was completed, the 2008 DEER Update values for the measures being updated were loaded into the VRT. Once this was completed, the VRT calculations were based on the ED updated UES values. Similarly, the 2008 DEER Update NTG and EUL spreadsheets were used to match NTG and EUL values to specific measures. Once the matching of NTG and EUL to measures was completed, the 2008 DEER Update values for the measures being updated were loaded into the VRT and the VRT calculations were based on the ED updated NTG and EUL values.

Figure 5: UES to VRT flow chart

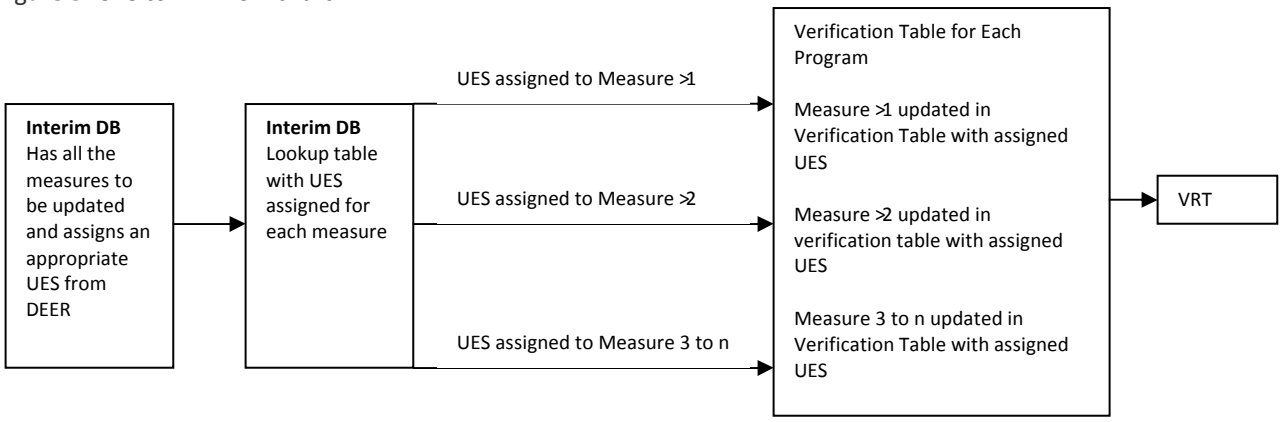
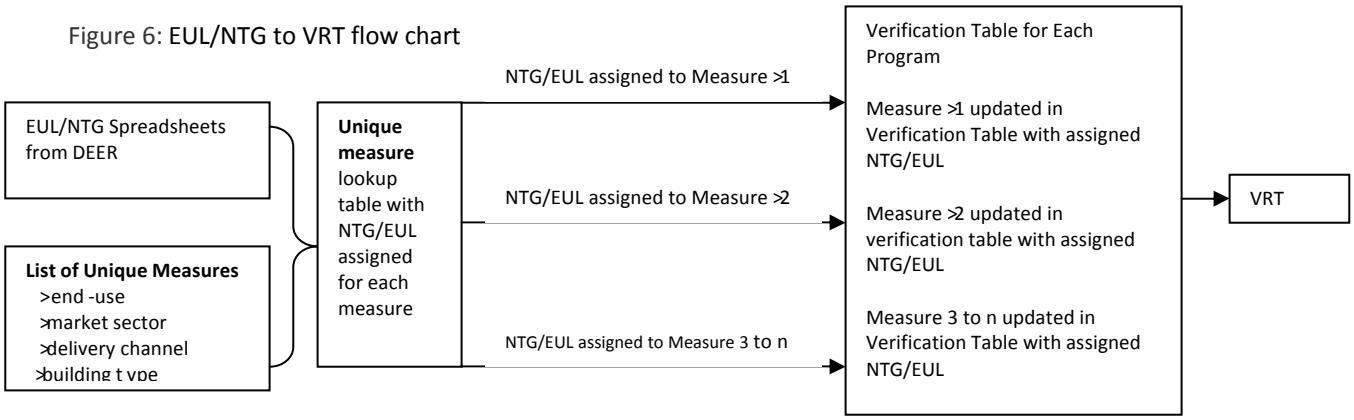


Figure 6: EUL/NTG to VRT flow chart



6.2. Populating the VRT with All Measures to Be Updated

The verification table in the VRT was modeled after the "Input" sheet of the E3 spreadsheet and consists of 128 variables. This table is the core component of the VRT as it contains measure level values from the E3 spreadsheet, the program tracking databases and the Energy Division updates.

Each of the 128 variables has a specific set of rules that were applied when the verification table was populated. As an example, the following rules were applied to the variable, "climate zone," which has a value from the utility E3 spreadsheet, the utility program tracking database, and an ED updated value.

- First, the climate zone value from the E3 spreadsheet was entered into the variable called *IOUE3ClimateZone;*
- Next, the climate zone value from the utility program tracking database was entered into the variable called *IOUPrgTrkClimateZone*;
- Then a zip code entered into the variable *IOUPrgTrkSiteZIPCode* was matched using a zip-code-to-climate-zone lookup table;
- If there was a match, then the associated climate zone was used as the value for the variable *EDUpdatedClimateZone;*
- If there was no match, then the value was set to the value in the variable *IOUPrgTrkClimateZone;*
- If *IOUPrgTrkClimateZone* was missing, the value was set equal to that in the variable *IOUE3ClimateZone*;
- Finally, if none of the above rules worked, the value was set to "System."

Complete documentation of the rules are included as part of Appendix G in the file entitled "VRT_DB_Fields_MarkUp(v.4_4).doc".

In addition to applying a consistent set of rules, there was a significant amount of data mapping between the program tracking database records and the E3 spreadsheets prior to populating the Verification Table in the VRT. Each program tracking database record was associated with one of the input measure line items in the utility E3 spreadsheets so that certain data values not present in the program tracking data, e.g., incremental cost, could be associated with a value found in the E3 spreadsheet.

Numerous adjustments and calculations were required in order to successfully map program tracking data to the E3 spreadsheets. Please see Appendix N for a list of the files (spreadsheets, SAS files, etc.) that document this detailed work, which are available upon request. The following list is a general summary of the procedures undertaken during this mapping exercise:

A. SDG&E/SoCalGas measures were mapped by matching "Measure Codes" provided in the program tracking data with the first part of the "Measure Name" in the E3 spreadsheets;

B. SCE measures were mapped based on a number of fields including "DEER RunID," "Climate Zone," "Target Sector" and "Measure End Use Shape";

C. PG&E measures were mapped by collapsing the list of measures in the E3 spreadsheet to unique records of measure name, climate zone, and EUL. The measure names in the program tracking database were an exact match with the

measure names in the E3 spreadsheets. The climate zones in the tracking database were labeled with a "Z" preceding the number, e.g. "Z10" for climate zone 10. By using the number portion of the climate zone or a "System" value, the climate zones were mapped. The EUL values found in the E3 spreadsheet were mapped to the tracking data using a combination of the building type and measure name from the tracking data;

D. Measure names were sometimes transposed and had to be corrected so that measure names in the E3 spreadsheets matched program tracking database measure names;

E. Some measure records in the program tracking database required summation to create a unique key to link back to the measures in the E3 spreadsheet;

F. Some date fields used to allocate quarterly quantities had to be cleaned and reformatted; generally the "installation date" field in the program tracking database was used to determine the quarter in which each measure was installed;

G. Some of the "unit definition" fields had to be cleaned up in order to properly match records. For instance, the "units" for the electric and dual-fuel measures were set to kWh, and the "units" for the gas measures were set to therms.

H. Mapping the proper measures values for upstream lighting required the use of "System" climate values for PG&E and SDG&E since there is not information of delivery area (retail outlet where bulbs were sold) as was provided in the SCE tracking data.

Once the mapping was complete, and the rules consistently applied, the verification table was functional within the VRT, in other words, the VRT was able to properly reference the values in the verification table, perform the automated E3 runs and generate a portfolio summary file.

To illustrate which fields are selected by the VRT in the final calculation, the NTG and EUL fields are described in Table 17:

Table 17: Example of EUL and NTG data fields in the VRT

Verification Table Fields	Sample Values	Description
IOU_E3_Ex_Ante_EUL	7	The EUL for this measure in the E3 file was seven years
IOU_PrgTrk_Ex_Ante_EUL	7	The EUL for this measure in the utility tracking database was also seven years
ED_Updated_Ex_Ante_EUL	7	Based on the information known for this measure, the 2008 DEER ex-ante update EUL was also seven years
IOU_E3_Ex_Ante_NTGR	.8	The NTG for this measure in the E3 file was .80
IOU_PrgTrk_Ex_Ante_NTGR	.8	The NTG for this measure in the utility tracking database was also .80
ED_Updated_Ex_Ante_NTGR	.64	Based on the information known for this measure, the 2008 DEER ex-ante update NTG was .64

By referencing both the program tracking database and E3 spreadsheet data sources, the changes made by ED (fields that begin with "ED_Updated") are more transparent and reviewable. In the example above, both the E3 spreadsheet and program tracking database records show an EUL of seven years for a particular measure. This is captured in the VRT under the fields *IOU_E3_Ex_Ante_EUL* and *IOU_PrgTrk_Ex_Ante_EUL*. The updated EUL for this particular measure, based on the 2008 ex-ante DEER Update EUL spreadsheet, is also seven years. This updated value is captured in the VRT under the field, *ED_Updated_Ex_Ante_EUL*. The values in this field are referenced by the VRT when the final PEB values are calculated.

In the EUL scenario, there is no change between the utility reported values and the Energy Division updates, but in the NTG example, the *ED_Updated_Ex_Ante_NTGR* is now .64, down from the utility reported value of .8 for both *IOU_E3_Ex_Ante_NTGR* and *IOU_PrgTrk_Ex_Ante_NTGR*. The .64 value is based on the 2008 DEER Update NTG spreadsheet, and will be the value that is referenced by the VRT when the final PEB value is calculated.

6.3. Updating Measures in the VRT with Installation Rates and DEER Parameters

6.3.1. Methodology for Updating Installation Rates in the VRT

The installation rate is a variable (*EDInstallRate*) in the Verification Reporting Template, which is used to adjust the claimed quantity for the population of measures covered by the verification study for each IOU.

The calculation of *EDInstallRate* for downstream measure groups is different than that for upstream measure groups (most notably CFLs). Each calculation is described below, followed by a description of the treatment of the measure groups that were excluded from the Verification Study.

6.3.1.1. Installation Rate: Downstream Measure Groups

For each sampled case ("*i*") from the program tracking databases, the quantity based on the verification survey inspections (*EDInspectionExAnteQuantity*) is divided by the quantity found in the IOU-supplied hardcopy project files for that same case. Equation 1 below illustrates this calculation.

$$\text{EDInstallRate}_i = \frac{\text{EDInspectionExAnteQuantity}_i}{\text{EDFileReviewExAnteQuantity}_i} \quad (1)$$

Where:

$EDInstallRate_i$=	The installation rate for the i^{th} case
$EDInspectionExAnteQuantity_i$=	The result of the ED on-site verification of installation for the i^{th} case
$EDFileReviewExAnteQuantity_i$=	The result of the review of the hardcopy project files of the rebated measure or project for the i^{th} case

When the quantity for a given sampled case in the program tracking database did not agree with the quantity in the hardcopy project files for the same case, the quantity in the hardcopy project files (*EDFileReviewExAnteQuantity*) took precedence. The rationale for doing this is that the number of units that a verification surveyor expected to see is represented in the *EDFileReviewExAnteQuantity*, which is based on a review of the hardcopy project files listing the specific measures, the size of the rebate for each measure, and a record of payment being made to the customer. Therefore, the values in *EDFileReviewExAnteQuantity* were assumed to be more accurate.

One of the original goals of the Contractor Verification Report was to correct clerical errors (e.g., an incorrect quantity or savings number is entered into the program tracking database) and incorporate the correction into the *EDInstallRate*. This level of review could only be completed for a small proportion of measures and programs. Thus, the *EDInstallRate* is mostly based on verified and utility claimed installations, where the utility claimed installations and savings estimates may contain an unknown number of data entry errors.

An overall savings-weighted installation rate is calculated based on the results *across all sampled cases*. For each case, the ex-ante gross kWh savings in the program tracking database ($IOUPrgTrkExAnteGrSavkWh_i$) is multiplied by the $EDInstallRate_i$. The result is then summed across all sampled cases and divided by the sum of the ex-ante gross kWh savings ($IOUPrgTrkExAnteGrSavkWh_i$) across all sampled cases. Equation 2 illustrates this calculation.

$$EDInstallRate = \frac{\sum_{i=1}^{n} EDInstallRate_i \times IOUPrgTrkExAnteGrSavkWh_i}{\sum_{i=1}^{n} IOUPrgTrkExAnteGrSavkWh_i} \quad (2)$$

where

EDInstallRate=	The overall savings-weighted installation rate for a given measure group or stratum
$EDInstallRate_i$=	The installation rate for the i^{th} case
$IOUPrgTrkExAnteGrSavkWh_i$=	The ex ante gross savings in the IOU program tracking database for the i^{th} case

These samples are typically stratified random samples or simple random samples. In situations where simple random samples were drawn, the weighted installation rate is used to adjust the quantity variable (*EDFilledExAnteQuantity*) for each case in the population from which the sample was drawn. In situations where stratified designs were employed, the installation rate within a given stratum was used to adjust the quantity variable (*EDFilledExAnteQuantity*) for each case in the stratum population from which the sample was drawn. The resulting variable from these calculations (*EDUpdatedExAnteQuantity*) was then spread, using various date variables available in the program tracking databases, across the eight quarters for 2006 and 2007.

6.3.1.2. Upstream Screw-In CFLS

The *EDInstallRate* for upstream screw-in CFLs and lighting fixtures for the residential and small commercial sectors was based on telephone interviews.

6.3.1.3. Residential Screw-In CFL Installation Rates

The installation rate characterizes the in-service rate for screw-in CFLs. The in-service rate is defined as the percent of purchased screw-in CFLs that are actually installed. The number of bulbs (*IOUPrgTrkExAnteQuantity*) recorded in the program tracking databases as shipped from manufacturers to participating retailers are adjusted using the *EDInstallRate*.

The *EDInstallRate* is estimated for each of the three electric utilities based on telephone surveys of a random sample of the population of residential customers. Respondents were asked whether they had purchased screw-in CFLs and, if they had, what percentage they had actually installed at a residence located within the utility's service territory.

The *EDInstallRate* does not include any adjustments for leakage (utility rebated products that leave the service territory) or adjustment for lamps that are placed in storage rather than being immediately used.

6.3.1.4. Nonresidential Screw-In CFL Installation Rate

For the purposes of the analysis covered by this report, the in-service rate for nonresidential lamps and lighting fixtures was set to 1.0. This assumption is known to be higher than actual and will be trued-up as part of the ongoing program evaluation.

6.3.1.5. Installation Rates: Excluded Measure Groups

Two classes of measure groups were excluded from any adjustments to their reported quantities:

A. Programs that contained one or more measure groups that were selected for verification also contained measure groups that were not selected for verification because of their relatively small savings. For such measure groups, the default value of 1.0 was assigned to the *EDInstallRate* and applied to the quantity variable (*EDFilledExAnteQuantity*) for the population of all measures within the given program's program tracking database.

B. For programs whose measure groups were not subjected to any verification, the default value of 1.0 was assigned to the *EDInstallRate* and applied to the quantity variable (*EDFilledExAnteQuantity*) for the population of all measures within a given program's program tracking database.

All of the verification reports can be found in Appendix A of this report.

6.3.2. Methodology for Updating EUL and NTG Values in the VRT

The following files were used to create lookup tables to update tracking level data with updated Net-To-Gross and Effective Useful Life values:

***NTG**: Updated DEER NTG Values for 2006-07 final 2008-10-10.xls*[35]

***EUL**: EUL_Summary_10-1-08.xls*[36] **and** *DEER2008 Database Definition - EUL v2.zip*[37]

6.3.2.1. NTG Update

To update NTG values, each unique measure name must have a corresponding market sector, market segment, end-use, and program delivery channel:

Market Sector	Nonresidential, Nonresidential – New Construction, Residential, Residential – New Construction
Market Segment	All, Agricultural, Multi-family, Single-family
End-use	All, Appliances, Building Shell, Custom Measures, HVAC, HVAC and Building Shell, HVAC/Water Heating, Lighting, Local Government

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[35] http://www.deeresources.com/deer2008exante/downloads/DEER_NTG_Values_and_Literature_Review_2008-10-10.zip
[36] http://www.deeresources.com/deer2008exante/downloads/EUL_Summary_10-1-08.xls
[37] Provided in Appendix E

Partnership, Milk Cooling, Motors, Refrigeration, Retro-commissioning, Water Heating, Whole Building

Program Delivery All Design Strategies, Building Design Incentive, Custom Incentive, Custom Rebate Based on Performance, Direct Install, Direct Installation, Downstream Prescriptive Rebates, Downstream Prescriptive Rebate and Direct Install, External Financing, Free Tune-up/Repair, New Innovative Delivery Strategies Designed to Minimize Free Ridership OR Direct Installation for Hard-to-Reach Customers, On-line Audit, On-site Audit, Prescriptive Rebate, Remote Audit via Phone/Mail-In/On-Line or CDROM approach, Retro-commissioning, Turn-in/Recycling, Upstream Prescriptive Rebate, Upstream Prescriptive Rebate - All channels, Various

Once this information is known, a lookup table can be created for each unique measure:

Measure Name	Program
HI EFF CLOTHES WSHER LVL 2=T-3B MEF=1.8 EF=5.5 1.5 2.65 3.5 CF	PGE2000 Res Appliances

In this example, the sector is "residential," the end-use is "appliances," and the unique measure is a "High Efficiency Clothes Washer." By filtering the "Updated DEER NTG Values for 2006-07 final 2008-10-10.xls" file for by these three parameters, the updated NTG value is either 81% or 85%. Since the unique measure name indicates that the "MEF = 1.8", the correct NTG value to update is 81% for Clothes Washer with a Modified Energy Factor >1.72, as shown below:

				Measure and Program Information			NTG Values and Sources	
Sector	Market Segment	End-Use	Type	Measure Name(s)	Target Market(s)	Program Delivery Method/ Channel	NTG Values Recommended for 2006-07 update	Documentation Reference
Residential	All	Appliances	Incentives	Clothes washer >1.72 MEF	Residential	Prescriptive	81%	Residential Appliances - Chapter 4
Residential	All	Appliances	Incentives	Clothes washer- 15% above DOE standard	Residential	Prescriptive	85%	Residential Appliances - Chapter 4

After NTG values are assigned, a member of the DEER team reviews the lookup table for accuracy. The results of this exercise are then merged with the data in the verification table.

6.3.2.2. EUL Update

To update EUL, each unique measure must have a market sector and end use (for lighting measures, the EUL varies by building type – see Rule 4 below).

Market Sector Residential, Non-Residential

End-use Agriculture, Appliances, Building Envelope, Cooking, HVAC, HVAC – Boilers, HVAC – Chillers, HVAC – Miscellaneous, HVAC – Other Central Plant, HVAC – Split/Package, Indoor Lighting,

Miscellaneous, Motors, Office Equipment, Outdoor Lighting, Plug Loads, Process Heating, Refrigeration, Water Heating

Using the same "High Efficiency Clothes Washer" example above, the "EUL_Summary_10-1-08.xls" table can be filtered for the residential appliances to determine that the EUL updated value for this measure should be 11 years:

Market	Enduse	Measure	DEER06-07 Update EUL
Residential	Appliances	High Efficiency Clothes Washer	11

However, not all measures are this straightforward, so the following rules apply when performing this exercise:

Rule 1 Custom Measures:
DEER does not provide EUL values for custom/process measures, therefore ED uses the EUL value from the program tracking databases for custom or process measures.

Rule 2 Rated Life:
DEER requires knowledge of the rated life of a lamp in order to select an EUL value for CFLs. If the rated life cannot be determined from the program tracking database information, ED assumes a rated life of 10,000 hours for the purpose of assigning an EUL value.

Rule 3 Non-DEER Measures:
When the measure cannot be found in DEER, the default is to use the EUL value provided in the utility workpapers. For example a measure called >Pool Pump Reset Agreement>is part of the verification study but this technology is not included in the DEER update. Therefore, the EUL for this measure defaults back to the workpaper level. If nothing is in the workpaper, the default is to the program tracking data level EUL.

Rule 4 Lighting Measures:
For both residential and nonresidential lighting measures, the EUL varies by building type, and is calculated by the following formula:

EUL = [Rated Life] / [Annual Usage based on building type] or 15 years, whichever is less.

For the "annual usage based on building type," the building types assignments used for applying UES (described below in section 6.3.3.

Methodology for Updating UES Values in the VRT ") should be the same building type assignments used for calculating EUL.

After EUL values are assigned, a member of the DEER team reviewesthe lookup table for accuracy. The results of this exercise are then merged with the data in the verification table.

6.3.3. Methodology for Updating UES Values in the VRT

2008 DEER Update Unit Energy Savings (UES) values for energy, demand, and gas savings were added to the program tracking data for the 13 programs updated in this report. This process was completed by developing a standard-format tracking database for all of the 13 programs – known as the ***Interim Database***. The interim database is a merge of the utility tracking databases with standardized field names and standardized data dictionaries. Development of the interim database was necessary because the utilities' program tracking databases do not use consistent structures, fields, and data definitions across utilities and with DEER. Development of the interim database is described in greater detail in Appendix >.

The main data inputs used to develop the interim database and assign the 2008 DEER Update UES values were:

- Program tracking data for all of the 13 programs, provided by the EM&V contractors evaluating those programs;
- The 2008 DEER database (version 2008.02.04), accessed with an interface program called MISer, both available on the DEER website at www.deeresources.com;
- Zip code to climate zone maps, from the CPUC; and
- NAICS codes tables, from NAICS[38] (to determine building type).

To facilitate the assignment of 2008 DEER Update values, the utilities' program tracking data had to be mapped to the measure properties used in DEER. The 2008 DEER Update format requires the following general information to be known in order to select the correct savings values:

A. DEER Run IDs / DEER Measure IDs ***OR***
B. Building type;
C. Climate zone; and
D. Measure Identification Information (Measure ID)

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[38] http://www.census.gov/eos/www/naics/

Once this information is known, the measures can be assigned DEER UES values.

Where this information was available in the program tracking databases, the format may have been converted to be consistent with the DEER structure. Where this information was not available in the program tracking databases, new data fields were created from existing program tracking database data or were assumed.

Several assumptions had to be made due to insufficient data in the program tracking databases when compared to the level of detail in DEER. For example, information about the base case was not given in the program tracking data.

The assumptions used were:

- All measures were assumed to have a base case of "Customer Average."
- All buildings were assumed to have the average building vintage for the utility.
- Program tracking database cases with the building type "residential multi-family" were not assigned 2008 DEER Update values, as DEER does not currently contain any values for multi-family installations.
- Only measures that are included in the latest version of the 2008 DEER Update were included as possible measures to be mapped. Several measure groups represented in the program tracking database are not yet included in the 2008 DEER Update.
- For line items that could not be assigned a particular DEER Building type based on NAICS code or program tracking database building descriptions, program information was used to either assign a default or a weighed DEER building type.

The tracking data from all utilities was first organized into a single table (see Table 18 for metadata). The table has 1.99 million line items, representing the installation of 106 million measure units. More details are provided in Appendix >.

Table 18: Basic Statistics on the combined program tracking system table

IOU	Count of Lines	Count of Measures	Ex Ante Gross Savings kWh	Ex Ante Gross Savings kW	Ex Ante Gross Savings therms
PGE	671,618	52,448,510	1,727,359,148	280,133	26,460,069
SCE	1,125,937	28,505,508	2,027,724,133	285,436	-
SCG	74,188	12,249,587	2,617,354	1,288	26,052,688
SDGE	118,651	13,215,678	513,433,142	76,576	3,418,018
Total	1,990,394	106,419,282	4,271,133,776	643,432	55,930,774

6.3.3.1. DEER Measure/Run IDs

Some of the tracking data had DEER Run IDs or DEER Measure IDs that facilitated a direct mapping to the 2008 DEER Update values. Table 19 shows the number of line items in the tracking data that had valid DEER Run IDs or valid DEER Measure IDs.

Table 19: Count of DEER Run IDs and DEER Measure IDs in Tracking Data

Utility	Line Items with DEER Run ID	% Of line items with DEER Run ID	Line Items with DEER Measure ID	% of Line Items with DEER Measure ID	Total Line Items
SCE	84,121	8%	-	0%	1,041,774
SCG	60,085	85%	69,675	98%	70,985
SDGE	59,026	50%	59,026	50%	118,651
PGE	-	0%	192,824	29%	671,618
Totals	203,232	11%	321,525	17%	1,903,028

6.3.3.2. Building Type

There are 23 DEER commercial building types used to lookup impact data. The existence of valid building type data varied considerably by program. Therefore, a table was created to map all unique combinations of building type and NAICS code in the program tracking databases to a DEER building type field.

The building type table was created with the following steps:

A. A list of default building types was created for each program according to known characteristics of the program.

B. A map of program tracking database records to DEER building types was created.

C. A map of 4-digit NAICS codes to DEER building types was created.

D. DEER building types were assigned to the program tracking database records according to the following logic:

   - The program tracking database building type was used if the program tracking database building type was able to be mapped to a DEER building type.

   - The NAICS code derived building type was used if the program tracking database building type was not used, but a valid NAICS value was available.

- If neither the program tracking database building type nor the NAICS code derived building type could be mapped to a DEER building type, then the program based defaults were used.

6.3.3.3. Climate Zone

A climate zone table was created in order to map program tracking database zip codes and climate zones to the list of standard climate zones that are in the 2008 DEER Update. All unique combinations of zip codes and climate zones that were in the original program tracking database were mapped.

The climate zone table was created with the following steps:

1. Valid zip codes in the program tracking database were reformatted to be numeric values between 90001 and 96162.

2. Valid climate zone values were reformatted to be numeric values between 1 and 16.

3. Default climate zones were created.

4. DEER climate zones were assigned to the program tracking database records using similar logic used as was used for building types.

6.3.3.4. Measure ID

A measure ID table was created in order to map the program tracking database measures to DEER Technology IDs using the measure description, sector, and savings units provided in the program tracking databases. Generally, a measure was mapped if the total gross program tracking database savings associated with the unique measure description constituted greater than 1% of the total portfolio savings.

If the program tracking database measure description was adequately descriptive, the measure was mapped to a DEER Technology ID. Program tracking database savings unit definitions were converted to be consistent with the unit definitions in DEER.[39]

6.3.3.5. Interim Database Results - Assigning DEER UES Values

The DEER MISer tool was used to extract essential data on all measures from the 2008 DEER Update. This data was then formatted into a table containing the essential fields needed to match tracking data line items to DEER to be used to look up UES values.

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[39] For example, DEER reports annual savings for furnace as >Therms/ kBtuh>, whereas program tracking data reports annual savings as >per furnace>. In case of a 72 kBtuh furnace, a multiplier of 72 was applied to the DEER per unit sa vings figure to resolve this difference in units. No change was made to the program tracking data, only DEER per unit savings were adjusted when necessary to match tracking data units.

Due to the high level of data complexity, as well as the large number of line items and table relationships, the entire Interim Database, including all lookup tables and additional code, was modeled using SAS software. The Interim Database was updated to include 2008 DEER Update non-interactive savings values for the targeted measures. Wherever a match between program tracking data and DEER was possible, the new value was added into the VRT data field labeled *EDDEERExanteGrUnitUESav* (kWh, kW and therms). A summary of the results of the UES assignment is presented in Table 20.

Table 20: Change in Savings due to UES Update by Program

Program	Database Lines Not Updated	Database Lines Updated	% Updated	Change in kWh	Change in kW	Change in Therms
PGE2000	568,974	29,811	5.0%	-4.5%	-13.1%	0.0%
PGE2004	668		0.0%	0.0%	0.0%	0.0%
PGE2080	55,828	16,337	22.6%	-13.7%	-9.0%	0.0%
SCE2500	268	123,242	99.8%	-81.5%	-83.4%	0.0%
SCE2501	104,907	26,548	20.2%	-11.7%	-10.1%	0.0%
SCE2502	694,615		0.0%	0.0%	0.0%	0.0%
SCE2511	30,301	124,700	80.5%	-35.7%	-28.2%	0.0%
SCE2517	19,928	1,428	6.7%	-3.4%	-4.7%	0.0%
SCG3507	3,203		0.0%	0.0%	0.0%	0.0%
SCG3510	1,055		0.0%	0.0%	0.0%	0.0%
SCG3513	437		0.0%	0.0%	0.0%	0.0%
SCG3517	62,959	6,534	9.4%	0.0%	0.0%	0.6%
SDGE3010	881		0.0%	0.0%	0.0%	0.0%
SDGE3012	918	141	13.3%	-10.2%	-9.4%	0.0%
SDGE3016	739	1,623	68.7%	-15.8%	-7.2%	0.0%
SDGE3017	2,235		0.0%	0.0%	0.0%	0.0%
SDGE3020	13,454	9,617	41.7%	-25.3%	-23.0%	0.0%
SDGE3024	38,492	2,134	5.3%	0.0%	0.0%	10.6%
SDGE3025	277		0.0%	0.0%	0.0%	0.0%
SDGE3028	23,541		0.0%	0.0%	0.0%	0.0%
SDGE3035	24,599		0.0%	0.0%	0.0%	0.0%
Portfolio	**1,648,279**	**342,115**	**17.2%**	**-12.5%**	**-13.4%**	**0.1%**

Full details of the changes in savings for each measure ID by program are provided in Appendix >.

6.4. Running the VRT to Calculate Adjusted Energy Savings and PEB Values

Once the verification table is populated with updated parameters, the VRT has the capability to calculate kWh, kW, and therm savings and TRC and PAC net benefits under two scenarios:

Scenario 1 – Utility installation counts, UES, NTG, and EUL values are unadjusted

Scenario 2 – Adjustments made to utility installation count, UES, NTG, and EUL values

6.4.1. Scenario 1 – Utility Installation Counts, UES, NTG, and EUL Values are Unadjusted

The VRT can produce kWh, kW, and therm savings and TRC and PAC net benefit values under Scenario 1 with two options that should produce similar results:

Option 0 – Utility calculated program level savings and net benefits from the E3 spreadsheet are simply added up
Option 1 – Utility measure level program level savings and net benefits from the E3 spreadsheet are recalculated using the VRT

The purpose of running Option 0 and Option 1 together is to compare the VRT calculation results to the utilities' program level calculations to confirm that the VRT is performing the calculation correctly.

By running the VRT with Option 0, the utility calculated kWh, kW, and therm savings and TRC and PAC net benefits from their E3 spreadsheet are simply aggregated across all programs. There is no re-calculation of the numbers filed by the utilities. The results from running the VRT using Option 0 are shown below in Table 21:

Table 21: VRT Ran with Option 0

	PG&E	SCE	SDGE	SoCalGas
EE Portfolio Savings (adjusted ex-ante)		PY 2006-2007		
Total Cumulative Savings (GWH)	2,247.9	2,291.4	546.9	0.0
Total Peak Savings (MW)	394.6	366.5	97.7	0.0
Total Cumulative Natural Gas Savings (MMTh)	28.9	0.0	4.2	36.4
PEB				
TRC Net Benefits	$ 849,935,066	$ 709,463,836	$ 239,563,872	$ 104,605,049
PAC Net Benefits	$ 1,004,782,871	$ 947,224,920	$ 294,519,698	$ 171,649,181

Running the VRT with Option 1 recalculates kWh, kW, and therm savings and TRC and PAC net benefits using the utility reported measures in the E3 spreadsheets with none of the values updated or adjusted in any way. The results from running the VRT using Option 1 are shown below in Table 22:

Table 22: VRT Ran with Option 1

	PG&E	SCE	SDGE	SoCalGas
EE Portfolio Savings (adjusted ex-ante)		PY 2006-2007		
Total Cumulative Savings (GWH)	2,247.9	2,288.7	546.9	0.0
Total Peak Savings (MW)	394.6	366.5	97.7	0.0
Total Cumulative Natural Gas Savings (MMTh)	28.9	0.0	4.2	36.4
PEB				
TRC Net Benefits	$ 850,910,871	$ 709,480,632	$ 239,563,872	$ 104,605,049
PAC Net Benefits	$ 1,005,758,675	$ 947,224,920	$ 294,519,698	$ 171,649,181

Table 23 shows the percentage difference between the results from Table 21 compared to the results from Table 22:

Table 23: Percentage Difference = [Option 1 - Option 0] / [Option 0]

	PG&E	SCE	SDGE	SoCalGas
EE Portfolio Savings (adjusted ex-ante)		PY 2006-2007		
Total Cumulative Savings (GWH)	0.00%	-0.12%	0.00%	
Total Peak Savings (MW)	0.00%	0.00%	0.00%	
Total Cumulative Natural Gas Savings (MMTh)	0.00%		0.00%	0.00%
PEB				
TRC Net Benefits	0.11%	0.00%	0.00%	0.00%
PAC Net Benefits	0.10%	0.00%	0.00%	0.00%

The VRT thus was able to reproduce the utilities' own calculations for kWh, kW, and therms exactly for PGE, SDGE, and SCG, and SCE demand. The calculations were off by -.12% for SCE kWh savings.

Similarly, the VRT was able to reproduce the exact calculations for TRC and PAC net benefits for SCE, SDGE, and SCG. The calculations were off for PGE by a fraction of a percent (.11% for TRC and .10% for PAC).

6.4.2. Scenario 2 – Adjustments Made To Utility Installation Count, UES, NTG, and EUL Values

The VRT can produce kWh, kW, and therm savings and TRC and PAC net benefit values under Scenario 2 through two options:

Option 2 – Updates to installation rates, UES, NTG, and EUL were made to measures at the E3 spreadsheet level
Option 3 – Updates to installation rates, UES, NTG, and EUL were made to measures at the program tracking database level

Of the 13 programs updated, 12 used Option 3 and only one (PGE2004) used Option 2. When running the VRT to calculate the adjusted kWh, kW, and therm savings and adjusted TRC and PAC net benefits, Option 2 and 3 are automatically combined. Table 24 shows the results of running the VRT using the combined output from Options 2 & 3:

Table 24: VRT Ran with combined Option 2&3

	PG&E	SCE	SDGE	SoCalGas
EE Portfolio Savings (adjusted ex-ante)		PY 2006-2007		
Total Cumulative Savings (GWH)	1,302.9	1,475.8	332.1	0.0
Total Peak Savings (MW)	226.9	244.3	70.1	0.0
Total Cumulative Natural Gas Savings (MMTh)	21.0	0.0	3.3	26.2
PEB				
TRC Net Benefits	$ 372,030,358	$ 343,522,928	$ 90,555,185	$ 42,630,751
PAC Net Benefits	$ 484,263,057	$ 525,870,539	$ 136,915,146	$ 102,631,114

Table 25 below compares the results from the combined Options 2 and 3 to the results from Option 1 and shows the percentage differences:

Table 25: Percentage Difference = [Option 2&3 - Option 1] / [Option 1]

	PG&E	SCE	SDGE	SoCalGas
EE Portfolio Savings (adjusted ex-ante)		PY 2006-2007		
Total Cumulative Savings (GWH)	-42.04%	-35.52%	-39.28%	
Total Peak Savings (MW)	-42.51%	-33.34%	-28.22%	
Total Cumulative Natural Gas Savings (MMTh)	-27.26%		-23.20%	-28.07%
PEB				
TRC Net Benefits	-56.28%	-51.58%	-62.20%	-59.25%
PAC Net Benefits	-51.85%	-44.48%	-53.51%	-40.21%

Refer to the VRT user's manual in Appendix F for instructions for producing results comparing the combined Option 2 and 3 to Option 1 for each individual program.

The values in Table 24 are entered into the RRIM Calculator together with the savings from the other program efforts described in section 4.1.1 to determine the appropriate earnings rate and calculate whether the utility will receive shareholder incentives or incur a penalty.

6.5. 2006 – 2007 Exceptions and Assumptions

6.5.1. Building Types

Knowledge of a measure's building type is required for assigning new UES values from DEER. ED assigned the building type "Single_Family_Residential" to all residential measures.

6.5.2. Nonresidential CFL hours of operation

For CFL measures, hours of use information is necessary for both EUL and UES updates. There are two methodologies used by the utilities to estimate hours of use:

1. Use all building types and take a straight average hours of use
2. Use a weighted average of the three most common building types

We opted for methodology #2, since it provides a more realistic estimate of the hours of use; specifically, we applied an equal 1/3 weighting to the following three non-residential building types: small office, retail, and sit-down restaurants.

6.5.3. DEER EUL and Rated Life

The EUL for CFLs is based on [rated life]/[annual hours of use]; if the rated life is not known, we gave the utilities the benefit of doubt and assumed a rated life of 10,000 hours. The range is between 6,000 and 12,000 hours. CFLs with a 12,000 hour rated life are rare, and utility workpapers show estimates of 9,200 hours. We believe the typical case in the current program environment is around 10,000 hours.

6.5.4. SPC Realization Rate for Custom Projects

DEER does not provide UES for custom or "process" measures. Rather than simply passing these values through as reported by the utilities, we applied a standard realization rate for custom/process measures based on a recently completed program evaluation study.[40] "The 2004-2005 Statewide Nonresidential Standard Performance Contract Program Measurement and Evaluation Study"[41] managed by SCE found a statewide gross realization rate of .79 for custom/process measures. The utility specific realization rates reported in the study vary, from .82 for kWh for PGE, to .77 for kWh for SCE, to .94 for kWh for SDGE, with no realization rate provided for SCG. The closest

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[40] ED is given discretion to use recently completed evaluation studies to update ex-ante estimates per Ordering Paragraph 3c of Decision 08-01-042.

[41] Completed on September 30th, 2008 by SCE. Available at www.calmac.org.

realization rate we found for SCG was from the "Evaluation of the Southern California Gas Company 2004-05 Non-Residential Financial Incentives Program,"[42] which found a realization rate of .75 for therms for SCG. It should be noted that the individual utility sample sizes in the SPC study are small, with anomalies for each utility sample. However, in the interest of providing a judicious representation of realized savings, we decided to apply a statewide realization rate of .79 for electric, demand, and natural gas savings across all utilities for measure that are custom/process type measures rather than passing the reported value through unmodified.

6.5.5. SCE Quarterly Installation Count

ED found that SCE does not report actual installation counts per quarter in the E3 calculator; instead, SCE provides annual counts, and the quarterly counts are calculated by taking the annual installation counts and dividing by four. The other utilities provide actual installation counts by quarter. Quarterly installation counts support a more accurate calculation of the PEB because the avoided costs are calculated on net present value and installations tend to peak towards the end of the year. SCE's assumption that installations are spread evenly throughout the year were considered incorrect. In order to correct this assumption in the VRT, the following rules were applied:

The quantity for a given record in a given program tracking database was allocated to one of eight quarters based on the record's *EDUpdatedPaidandInstalledDate*. There were two rules regarding the *EDUpdatedPaidandInstalledDate* depending on whether it was an upstream or downstream program:

Rule #1: For downstream programs, for each record, the value for *EDUpdatedPaidandInstalledDate* was set to the *IOUPrgTrkPaidDate,* which represents the date the rebate check was prepared. There was only one exception where this could not be done, SCE2501. This small program did not have a month-year date value but only a year value (2007). For this program, the quantity was divided by four and spread evenly across the four quarters of 2007.

Rule #2: For upstream programs, the value for *EDUpdatedPaidandInstalledDate* was set to the *IOUPrgTrkPaidDate,* which represents the date that the payment to the manufacturer was authorized. For upstream measures, customer installations were assumed to occur within the same quarter that the payment to the manufacturer was authorized, i.e., there was no assumed lag between the date on which the payment to the manufacturer was authorized and the date on which the customer installed the measure.

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[42] Completed on >une 7th, 2006 by SoCalGas. Available at www.calmac.org.

6.5.6. Residential / Nonresidential Split Assumption for CFLs

In the workpaper entitled "Integral (Screw-In) Compact Fluorescent Lamp (CFL) Non-Residential" (WPSCRELG0022, Revision 0, dated December 18 2007),[43] SCE assumes that 90% of the upstream CFLs are installed in residential buildings and 10% are installed in nonresidential buildings, citing an analysis of 1994 consumer mail-in survey data (manufacturer bounce back cards).[44] PG&E uses the same 90%/10% installation split, but has not provided a workpaper to Energy Division to support this assumption. PG&E estimated that 100% of the upstream lighting products would go into residential buildings when the program was approved, but did not expressly notify Energy Division of the change to the 90%/10% residential/nonresidential split assumption. SDG&E, which implements essentially the same upstream lighting program, assumes that 100% of the upstream CFLs are installed in residential buildings.

Energy Division cannot validate the 90%/10% installation split assumption at this time for upstream CFLs sold for the following reasons:

A. There are likely to be significant differences between the 1994 programs, lighting products, and purchasing patterns compared to 2006-2007.

B. The extent to which the 1994 consumer mail-in survey data contains possible self-selection bias is not known.

C. Whether or not the 1994 consumer mail-in survey data were drawn from a random and representative sample of customers cannot be ascertained.

D. Customer survey data collected between 2004 and 2007[45] as part of the upstream lighting program evaluations suggest that the proportion of commercial customer purchases is likely to be between 3% and 7%.

E. Preliminary data from 06-07 in-store intercept surveys[46] suggest that the volume of CFL purchased by nonresidential customers from retail channels is about 2%, but the data do not appear representative and conclusive at this time.

F. Surveys of recipients of CFLs given away at the events organized by IOUs in 2006-2007 show that 1–2% of CFLs given away are installed in nonresidential premises.[47]

G. The number of commercial building sockets which can receive CFLs (data available from the Commercial End Use Survey database) combined with the fraction of likely upstream commercial purchasers (in D above) does

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[43] Provided in Appendix K
[44] Provided in Appendix M
[45] Personal communication KEMA staff to Tim Drew of Energy Division October 28, 2008
[46] Personal communication KEMA staff to Tim Drew of Energy Division October 28, 2008
[47] See Appendix A5

not appear to support more than 2-5% of the 2006-2007 upstream CFLs volume (>50,00 0,000 bulbs) being installed in non-residential buildings.

The data sources mentioned above strongly suggest that nonresidential installations of CFLs sold through upstream programs is far less than the 10% that PG&E and SCE have assumed. ED has therefore calculated kWh, kW and PEB for SCE and PG&E assuming that 5% of upstream CFL products, rather than 10%, are installed in non-residential buildings. SDGE's assumption that 100% of upstream CFL products are installed in residential buildings is unchanged.

6.5.7. Handling of Audit Impacts

No adjustments were made to savings claimed as a result of audit programs.

6.5.8. Use of HVAC Interactive Effects

The interior building load reduction/increase due to a measure installation in a facility can interact with the heating, ventilating and air-conditioning (HVAC) system, resulting in changes in the consumption of electricity or gas. These HVAC interactive effects can result in positive or negative changes in consumption, and can cross fuel types and energy/demand categories. This raises the general issue of how these interactions affect the total savings for the project, and thus the program. A second database in DEER calculates a separate total UES savings that includes HVAC interactive effects. ED has calculated the MPS and PEB without any HVAC interactive effects for purposes of this verification report.

In comments during the DEER workshops and meetings, the utilities put forward arguments in favor of residential lighting and appliances not including any negative "interactive effects," but keeping positive "interactive effects" for non-residential measures.

SCE has been claiming no positive or negative interactive effects for CFLs in residential and non-residential settings. PGE and Sempra claim positive interactive effects for CFLs in non-residential settings, but they are not claiming negative interactive effects for those installations. To be consistent across utilities, Energy Division decided to make this first update based on DEER UES values *without* HVAC interactive effects.

However, Energy Division believes that interactive effects are real, and should be included in the UES values applied to the final true-up.

6.5.9. RCA and DTS UES Assumptions

DEER provides multiple base case gross savings values for measures such as duct sealing and refrigerant charge and airflow. In determining which of these values to use when

assigning a UES, Energy Division decided to select the “typical” value in DEER rather than calculating a value based on a combination of the typical and “high” case values.

7. Calculation of Shareholder Incentives

Energy Division developed a spreadsheet tool, the RRIM Calculator, to calculate the earnings or penalties for each utility using GWh, MW, and MMTh accomplishments and TRC & PAC net benefits from the VRT output and the savings from the other program efforts described in section 4.1.1. The RRIM Calculator is designed to calculate and track the 2006-2007 and 2008 interim incentives as well as the final three year cycle true-up.

7.1. Walk Through RRIM Calculator

The narrative below describes the purpose, method, and source data for each step of the calculation for the first interim claim only. Example formulas are taken from column C of the RRIM Calculator. The RRIM is provide as part of Appendix G.

Savings Goals

Location on Spreadsheet:
Rows 8-10.

Description:
The CPUC adopted GWh, MW, and MMTh savings goals for 2007. The goals for GWh and MMTh are cumulative as describe in section 6.3.1 of Decision 07-10-032.

Source of Data:
Decision 04-09-060, Attachment 9.

MPS Goals (80% of goal)

Location on Spreadsheet:
Rows 13-15.

Description:
For each individual metric, the point above which the IOUs can claim earnings based on the PEB.

Source of Data:
Calculated from Savings Goals

Dead Band (65% of goal)

Location on Spreadsheet:
Rows 18-20.

Description:
For each individual metric, the point above which the IOUs are not liable for payment of penalties.

Source of Data:
Calculated from Savings Goals

Functional Role in Spreadsheet:
Used to calculate the amount of penalties if penalties must be paid.

EE Portfolio Savings (adjusted ex-ante)

Location on Spreadsheet:
Rows 24-26.

Description:
The GWh, MW, and MMTh accomplishments for 2006 and 2007 EE programs.

Source of Data:
Sum of Annual Net kWh, Sum of Net >ul-Sept Pk (kW), and Sum of Annual Net Therms from the Output sheets of the E3 calculator output files produced by the VRT.

Functional Role in Spreadsheet:
A component of what is used to determine the percentage of the adopted goal that was achieved.

50% C&S Savings (adjusted ex-ante)

Location on Spreadsheet:
Rows 29-31.

Description:
The estimated GWh, MW, and MMTh accomplishments associated with the utilities' codes and standards advocacy work.

Source of Data:
Tables 3-5 in the *Statewide Utility Codes and Standards Program Interim Verification Report*

Functional Role in Spreadsheet:
A component of what is used to determine the percentage of the adopted goal that was achieved.

04-05 EM&V Adjusted EE Portfolio Savings

Location on Spreadsheet:
Rows 34-36.

Description:
The GWh, MW, and MMTh accomplishments for 2004 and 2005 EE programs. Ex-post numbers are used where available.

Source of Data:
A mix of program level ex-post results, as reported in final 2004-2005 program evaluation reports, and 2004-2005 IOU reported accomplishments where ex-post results are not available.

Functional Role in Spreadsheet:
A component of what is used to determine the percentage of the adopted goal that was achieved.

EM&V Adjusted LIEE Savings

Location on Spreadsheet:
Rows 39-41.

Description:
The GWh, MW, and MMTh accomplishments for 2004 through 2007 LIEE programs. The savings data for the 2005 LIEE program come directly from the final 2005 LIEE Impact Evaluation completed in December 2007. Savings for 2006 and 2007 have not been adjusted to be consistent with the findings of the 2005 LIEE Impact Evaluation. Savings data for 2004 are directly from the IOUs' 2004 LIEE Annual Report.

Source of Data:
A mix of program level ex-post results, as reported in final 2005 LIEE program evaluation report; 2004, 2006, and 2007 IOU reported accomplishments; and extrapolations of demand savings for 2004 and 2005.

Functional Role in Spreadsheet:
A component of what is used to determine the percentage of the adopted goal that was achieved.

Total Savings

Location on Spreadsheet:
Rows 44-46.

Description:
The sum of the GWh, MW, and MMTh accomplishments for EE Portfolio Savings, 50% C&S Savings, 04-05 EM&V Adjusted EE Portfolio Savings, and EM&V Adjusted LIEE Savings.

Functional Role in Spreadsheet:
Used to determine what percentage of the adopted goal was achieved.

MPS Individual Metric Performance

Location on Spreadsheet:
Rows 49-51.

Description:
The percentage of the individual adopted GWh, MW, and MMTh goals that are deemed accomplished.

Functional Role in Spreadsheet:
Used to determine what percentage of the adopted goal was achieved for each individual metric (GWh, MW, and MMTh).

MPS Average Metric Performance

Location on Spreadsheet:
Row 52.

Description:
The percentage of the average adopted GWh, MW, and MMTh goals that are deemed accomplished.

Functional Role in Spreadsheet:
Used to determine what percentage of the adopted metric goal was achieved on average.

TRC Net Benefits and PAC Net Benefits

Location on Spreadsheet:
Rows 55-56.

Description:
The Total Resource Cost and Program Administrator Cost avoided cost net benefits.

Source of Data:
Benefit – Cost NPV for Program TRC ($) and Program PAC ($) from the Output sheets of the E3 calculator output files produced by the VRT.

Functional Role in Spreadsheet:
Components of what is used to determine the Performance Earnings Basis for each IOU.

PEB

Location on Spreadsheet:
Row 57.

Description:
The Performance Earnings Basis. The metric adopted for measuring program performance. The metric is ((2/3)*(TRC net benefits))>((1/3)*(PAC net benefits)).

Functional Role in Spreadsheet:
Used as a basis for determining the amount of IOU earnings or penalties.

PEB at MPS Threshold

Location on Spreadsheet:
Row 58.

Description:
The Performance Earnings Basis, adjusted to accommodate the rules established for meeting the MPS threshold. The result is zero if the metric average or any of the individual metrics are below the adopted thresholds.

Functional Role in Spreadsheet:
Used as a basis for determining the amount of IOU earnings or penalties.

Function of Excel Formulas:
=IF(AND(C52>=0.85,C49>=0.8,C50>=0.8,C51>=0.8),C57,0)
This formula sets the cell equal to the PEB if the thresholds for the metric average and the individual metrics are greater than or equal to the adopted thresholds. If this condition is not met, the cell will equal zero.

Earnings/Penalty Cap

Location on Spreadsheet:
Row 60.

Description:
The three year earnings/penalties caps for each IOU adopted in D. 07-09-043.

Functional Role in Spreadsheet:
Used to cap the total earnings.

Earnings Rate

Location on Spreadsheet:
Row 62.

Description:
The rate at which the IOU may earn on the PEB.

Functional Role in Spreadsheet:
Used to determine the earnings rate.

Function of Excel Formulas:
=IF(AND(C52>=0.85,C52<1,C58>0),0.09,(IF(OR(C58=0,C52<0.85),0,(IF(AND(C49>=0.95,C50>=0.95,C51>=0.95,C52>=1),0.12,0.09)))))
This formula sets the cell to 9% if the metric average is equal to or greater than 85%, and all of the individual metrics are equal to or greater than 80% of the Commission-adopted savings goals. The cell is set to 12% if the metric average is equal to or greater than 100%, and all of the individual metrics are equal to or greater than 95% of the Commission-adopted savings goals. If neither of these conditions is met, the cell will be equal to zero.

Total Earnings

Location on Spreadsheet:
Row 64.

Description:
The total individual earnings that may be claimed by each utility.

Explanation of Formulas:
=MINA(C62*C58*0.65,C60)
This formula sets the cell to equal the Earnings Rate times the PEB at MPS Threshold, or the Earnings/Penalty Cap, whichever is lower.

Penalties

Location on Spreadsheet:
Row 66.

Description:
After all the required data are entered into the spreadsheet, the cell will be equal to "Yes" if penalties are required.

Functional Role in Spreadsheet:
To indicate whether or not penalties are required for the utility and, if so, cause the spreadsheet to calculate penalties.

Explanation of Formulas:
=IF(SUM(C44:C46)>0, (IF(OR(C55<0,C49<=0.65,C50<=0.65,C51<=0.65),"YES","NO")),0)
This formula sets the cell to "YES" if there are negative TRC net benefits or if any of the individual metrics are equal to or below 65%.

Total Penalties

Location on Spreadsheet:
Row 68.

Description:
The total individual penalties that should be assessed to each utility.

Explanation of Formulas:
=ABS(((C18-C44)*0.05*1000000)>((C19 -C45)*25*1000)>((C20 -C46)*0.45*1000000))
If the utility is in the penalty range as indicated by a "YES" in the Penalties cell, penalties are calculated according to ordering paragraph 2f of Decision 07-09-043.

7.2. Conclusions

The results of the RRIM calculation are provided in Table 26. Based on the results of the analysis described in this report PG&E and SDG&E are not eligible for an interim EE shareholder earnings payment for program years 2006-2007, SCE is required to pay $17,844,483 in penalties, and SoCalGas is eligible for an interim EE shareholder earnings payment of $3,663,906 .

The utilities shall file advice letters per Ordering Paragraph 8 and Attachment 7 of Decision 07-09-043. Attachment 7, point 8 on page 2 is reproduced below.

> 8. Within 45 days of issuance of the Final Verification Report, the utility will file an advice letter for Energy Division disposition pursuant to section 7.6.1 of General Order 96-B, citing the Verification Report. The advice letter will address whether based on that report there are any earnings or penalties, and if so at what level, for the interim claim.

Table 26: RRIM Calculator Output

	First Earnings Claim (PY2006-2007)				
	PG&E	SCE	SDGE	SoCalGas	Total
Savings Goals			PY 2004-2007		
Total Cumulative Savings (GWH)	3,260.0	3,621.0	1,102.4		**7,983.40**
Total Peak Savings (MW)	708.0	760.0	209.5		**1,677.50**
Total Cumulative Natural Gas Savings (MMTh)	47.0		9.5	53.3	**109.80**
MPS Goals (80% of goal)					
Total Cumulative Savings (GWH)	2,608.0	2,896.8	881.9		**6,386.72**
Total Peak Savings (MW)	566.4	608.0	167.6		**1,342.00**
Total Cumulative Natural Gas Savings (MMTh)	37.6		7.6	42.6	**87.84**
Dead Band (65% of goal)					
Total Cumulative Savings (GWH)	2,119.0	2,353.7	716.6		**5,189.21**
Total Peak Savings (MW)	460.2	494.0	136.2		**1,090.38**
Total Cumulative Natural Gas Savings (MMTh)	30.6		6.2	34.6	**71.37**
Achieved Savings Towards MPS					
EE Portfolio Savings (adjusted ex-ante)			PY 2006-2007		
Total Cumulative Savings (GWH)	1,302.9	1,475.8	332.1		**3,110.79**
Total Peak Savings (MW)	226.9	244.3	70.1		**541.29**
Total Cumulative Natural Gas Savings (MMTh)	21.0		3.3	26.2	**50.46**
50% C&S Savings (adjusted ex-ante)			PY 2006-2007		
Total Cumulative Savings (GWH)	69.2	69.3	16.2		**154.70**
Total Peak Savings (MW)	19.8	18.7	4.7		**43.20**
Total Cumulative Natural Gas Savings (MMTh)	1.9		0.2	3.1	**5.20**
04-05 EM&V Adjusted EE Portfolio Savings					
Total Cumulative Savings (GWH)	907.0	1,079.5	365.8		**2,352.39**
Total Peak Savings (MW)	193.6	204.9	64.0		**462.43**
Total Cumulative Natural Gas Savings (MMTh)	18.4		4.4	11.1	**33.86**
EM&V Adjusted LIEE Savings			PY 2004-2007		
Total Cumulative Savings (GWH)	100.3	81.2	21.3		**202.74**
Total Peak Savings (MW)	20.1	16.6	5.2		**42.01**
Total Cumulative Natural Gas Savings (MMTh)	4.6		0.9	3.5	**8.95**
Total Savings			PY 2004-2007		
Total Cumulative Savings (GWH)	2,379.4	2,705.8	735.4		**5,820.61**
Total Peak Savings (MW)	460.4	484.5	144.0		**1,088.93**
Total Cumulative Natural Gas Savings (MMTh)	45.8		8.8	43.8	**98.47**
MPS Individual Metric Performance					
Percent of GWH Goal	73%	75%	67%		73%
Percent of MW Goal	65%	64%	69%		65%
Percent of MMTh Goal	98%		92%	82%	90%
MPS Average Metric Performance	**79%**	**69%**	**76%**	**82%**	**76%**
PEB					
TRC Net Benefits	$ 372,030,358	$ 343,522,928	$ 90,555,185	$ 42,630,751	$ 848,739,221
PAC Net Benefits	$ 484,263,057	$ 525,870,539	$ 136,915,146	$ 102,631,114	$ 1,249,679,856
PEB	$ 409,441,257	$ 404,305,465	$ 106,008,505	$ 62,630,872	$ 982,386,099
PEB at MPS Threshold	$ -	$ -	$ -	$ **62,630,872**	$ **62,630,872**
Earnings/Penalty Cap	$ 180,000,000	$ 200,000,000	$ 50,000,000	$ 20,000,000	$ 450,000,000
Earnings Rate				**9%**	
Total Earnings	$ -	$ -	$ -	$ 3,663,906	$ 3,663,906
Penalties	NO	YES	NO	NO	
Total Penalties		$ 17,844,483			$ 17,844,483

8. List of Appendices

Appendices may be downloaded from:

http://www.cpuc.ca.gov/PUC/energy/electric/Energy+Efficiency/EM+and+V/

or

http://eega2006.cpuc.ca.gov

Appendix A1:	Residential Program Verification Report
Appendix A2:	Small Commercial Program Verification Report
Appendix A3:	Major Commercial Program Verification Report
Appendix A4:	Industrial Program Verification Report
Appendix A5:	Local Government Program Verification Report
Appendix B:	List of 2004-2005 Evaluation Reports and Workbooks used to Calculate Savings
Appendix C:	Calculation of Realization Rates for 2004-2005 Programs
Appendix D:	2004-2005 Savings Calculations
Appendix E:	DEER EUL Workbook
Appendix F:	VRT Users Manual
Appendix G:	VRT and Associated Files
Appendix H:	Statewide Utility Codes and Standards Program Interim Verification Report
Appendix I:	*Reserved for 2006-2007 Financial Audit Reports*
Appendix J:	Methods for Updating DEER Values
Appendix K:	SCE CFL Workpaper
Appendix L:	Workpaper for Measure Group Definitions
Appendix M:	1994 CFL Study
Appendix N:	List of Materials Available upon Request